The United States MILLER

Published by E. HARRISON CAWKER. { Vol. 17, No. 1. } MILWAUKEE, MAY, 1884. { Terms: $1.00 a Year in Advance. Single Copies, 10 Cents.

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THE HAZARD OF FLOURING MILLS.

BY I. M. CHRISSINGER, MINNEAPOLIS, MINN.

(A paper read before the meeting of the Western Mutual Underwriters' Association, Chicago, March 20.)

The "Hazard of Flouring Mills" is a subject of the greatest importance to underwriters, and one which presents probably more difficulties to overcome than any other class of manufacturers with which we have to contend. It is a subject that scientists have studied and yet the problem remains unsolved. I certainly feel that I am incapable of doing this subject justice, and wish some one more competent and better qualified had been called upon to treat upon the "Hazard of Flouring Mills." I shall endeavor, however, to cover the ground to the best of my ability, and at the same time without going into unnecessary details. A full and exhaustive essay upon this subject would consume so much of your valuable time that this must necessarily be made as brief as possible.

I shall first take the mill or building itself. On account of the necessary machinery contained therein, flouring mills should be built in the most substantial manner possible, and all precautions should be taken to prevent settling or sagging. The foundations cannot be too substantial, and too much care cannot be taken in their general construction. All timbers and material should be of the very best seasoned wood, and of great strength. The interior arrangements should be such as to insure the greatest convenience, safety and best results.

The location of a mill is a matter of the greatest importance, for a flouring mill located in an unsuitable and unprofitable locality, no matter how well built or equipped, is entirely worthless from an insurance point of view.

As to the motive power of flouring mills, there seems to be a diversity of opinion, and I shall only note a few points. If the mill is steam power, the boiler and engine-room should be detached or protected thoroughly by fire-proof walls, and all openings by iron doors, and the wood-work overhead should be at least eight (8) feet from the boilers. The floors in front of the furnace should be of earth, brick, or stone—no wood should be allowed. Boilers should be well bricked in, and thoroughly covered. I regard steam power, properly constructed, preferable to water power.

MACHINERY.—This should be of the most approved pattern, and located so as to give the most favorable results. The product of the mill is of the greatest importance, for the milling business is so close that a mill turning out too small a percentage of first grade flour is a very poor investment. The old mills, run under the stone system, are especially dangerous, and should in every case be avoided. It has been fully demonstrated (and we have paid for the knowledge,) that mills of this kind are short-lived. The owners reason thus: It will hardly pay them to change their mill throughout, and make a roller mill of it, so they see that their insurance is placed in good companies, and up to the limit. After that they run the mill as best they can, and if she burns, all right. Of course they do not intend to set fire to their property, but under the circumstances they are not as careful as they should be, and are willing to take their chances. In fact, unless a mill is, strictly speaking, a roller mill, it is an extremely dangerous risk, as the day of old-fashioned and unimproved mills has passed.

The system of heating in flouring mills should always receive careful attention. Steam pipes, properly arranged and protected, are preferable to any other system. I do not think inspectors, as a rule, need any information or advice on this subject.

CLEANLINESS.—This is an all-important feature in the physical hazard of flouring mills. There is a chance of saving a clean mill in case of fire. But a dirty one is about as dangerous as a powder magazine.

ACCUMULATIONS OF FLOUR DUST.—We cannot be too careful in this direction. Dust-rooms or catchers should be so constructed that no dust vents into mill or on roof. Oily rags or waste used about machinery should be carefully handled, and not allowed to lie around loose. The waste pails or buckets recommended by this association supply a much-needed want in this direction. It is imperative that mills should be thoroughly and frequently swept and cleaned, and all hangers, bearings, gearings, and in fact, all the machinery, kept clean and free from dust and cobwebs.

ILLUMINATING.—Many of our best mills are lighted by electricity which is a move in the right direction. This system does away with poor oils and poorly constructed lamps. If oil is used it should be of the best quality, and lamps of most improved kind, amply protected against dust. They should receive careful attention and be kept perfectly clean. Poor lamps and oils are very dangerous, and mill owners should spare neither pains nor expense in trying to avoid fire from this source. Tubular lanterns of the most approved patterns only should be allowed—open lights strictly prohibited. I have frequently seen globes on lanterns with a piece broken out, and a piece of paper stuck over the hole. Such things should not be overlooked by inspectors, and mill-owners who allow defective lanterns or lamps to be used are guilty of gross carelessness.

FIRE PROTECTION.—I would advise a complete system of fire protection, both as regards apparatus and employes. The latter should be instructed how to act in case of fire, and each man should have his post and duties to perform. They should be thoroughly drilled and made familiar with what is expected of them in case of emergency, so as to avoid confusion. As a simple and reliable protection, give me barrels and buckets of water properly distributed, and kept in good order; not as we sometimes find them—barrels empty, and wooden buckets which fall to pieces at the slightest provocation. This protection comes within the reach of every one, and no matter how many other conveniences are at hand the barrels and buckets are a necessity, and no risk should be written without them. Where it is practicable stand-pipes, with hose attached, should be placed in mills, and should always be ready for use. I would also recommend that perforated steam pipes be placed in flouring mills, as within a short time I have had my attention called to one flouring mill located at Waseca, Minn., and one paper mill located at Eau Claire, Wis., where steam saved both buildings, and the loss in both cases was nominal. It should be the duty of one man to see that all fire apparatus is in good working order, and extinguishers, stand-pipes and hose should be frequently and thoroughly tested, and that the casks or barrels are kept filled with water. The watchman should be a competent and trustworthy man. He should be thoroughly acquainted with the location and working of all fire apparatus, and if possible, should be a man who would not lose his head in case of emergency.

MORAL HAZARD.—Inspectors cannot be too particular regarding the moral hazard of the property under inspection. Inquiries regarding the standing of owners, both financially and morally, cannot be too searching. The grade of flour produced and the general condition of the business are also matters of the greatest consideration. It should be borne in mind that a risk, physically good and morally rotten, is better off than on the company's books.

You will observe that I have given you my opinion briefly upon the following points: First, a flour mill building and its construction, showing the necessity of a well-constructed building and the necessary precautions to be taken in the foundation materials, interior arrangements, convenience, safety, and the best results; second, the location, which is an all-important matter to an inspector; third, power; fourth, machinery—here is where, in my opinion, an inspector has to exercise discretion and judgment. In order to get a true and accurate survey, and see that everything is in first-class condition, takes time and patience. Fifth, heating. Believing that steam-pipes, properly arranged and protected, are the best, I pass on to cleanliness. Here again the inspector must have an eye to business, and from experience I find many well-constructed and to all appearances paying mills in a horrible condition: Dusty, dirty, and cobwebs in profusion. To illustrate, I, but a few days since, inspected a mill and found it simply filthy. Result—I advised my company to cancel, and notified the owners to that effect. They very politely write the secretary that his inspector was more *nice* than *wise*. Why? Simply because we will not encourage their slovenly way of doing business. They do not take into consideration the fact that this is an inspector's duty, and that by being what they please to term *over nice*, is only doing justice to them as well as to each and every member of our company. Frequent and thorough inspection of the physical hazard in its most minute details, coupled with careful and exhaustive investigation regarding the moral hazard, is the true basis of mutual insurance, and applies particularly to this class of risks. No matter how prolific our field may be, no matter how carefully we may have sown the seed, weeds will spring up among the grain, and our success and safety depend upon their prompt removal. The mill referred to is comparatively new, and, I understand, yields a handsome dividend to its stockholders. Yet it is only a question of time when mills allowed to remain in this condition will become food for flames, and then the companies are at a loss to know why such *fine risks burn*. You immediately send your adjuster to the scene of the fire. He investigates thoroughly, and the cause of the fire is classed as "Unknown," and forever remains a mystery, when, in plain English, the true cause was dirt and gross carelessness on the part of the owners.

LIGHTS.—Time will not permit me to dwell long upon this subject. But let me warn you that this is a very important feature, particularly in flouring mills. Here, again, judgment must be called into play, and strict attention given to oils, lamps, lanterns, jets, and other modes of lighting. Defects can be found in almost every mill the inspector visits, and he should not hesitate to point them out to the owner, and have them remedied at once, not by promise, but by action. Fire protection.—I think I have given you my ideas fully on this question, so will pass on to the last subject, viz.:

THE MORAL HAZARD.—Here is food for thought. The inspector must be careful, judicious and thorough, for upon the moral hazard depends largely whether a policy be issued or not. He should, as far as possible, ascertain the financial standing of the owner, as well as his position or standing in the community in which he resides. In these matters he cannot be too searching, and now I shall bring my subject to a close. If I have brought forward any ideas which will be of service or benefit to my co-workers in the field, I shall be more than paid for my first effort in this direction, and shall consider the time well spent. Permit me, gentlemen, to sincerely thank you for your kind indulgence and attention.

A TOUCHING INCIDENT.

The distressing accident at the mill of Merriweather & Fredericks, by which a little son of Mrs. Leiyhelm of North Seattle, lost first his right arm and a few hours afterward his life, is well remembered by the entire community. About the accident clustered several features which impressed it with remarkable vividness upon the memory and makes it peculiarly sad—the tender age of the boy, the frightful nature of his injuries, the widowed mother for whose support he was toiling—all these things united to form a most pathetic picture. The facts of his death are in a general manner known. But yesterday, from the lips of his sisters, were heard the particulars of his last moments, which lifted up the sombre cloud that fell sadly down, and let the light of heaven in. It was at the hospital, and after the midnight hour. The operation had been performed; the remainder of the bruised and torn arm had been taken off, and the little boy lay propped up in his bed with pillows. The Sisters of Mercy stood by on either side, to do what gentle acts they might to soothe his pain. Gratefully the little sufferer looked at them, and faintly said: "You are all so kind to me; I don't know how I ever can pay you. I can't work any more, and mamma's too poor to pay it." One of the sisters stooped down to him, saying: "My poor little boy, don't you know you are dying?" For the angel, from far beyond the twinkling gems that pin night's curtains up, came silently through the open door and stood beside the dying child, and cast upon his pain-pinched face the light of that strange land. "Am I?" he wonderingly said. And then, thinking of that prayer heard first long centuries ago, learned from his mother's lips, he softly spoke the words: "Our Father—which art in Heaven—hallowed be—Thy—name; Thy kingdom—come—Thy will—be—done—." The whispers ceased, the features changed more and more, a faint smile came over the pale face and the little boy had gone with the kind messenger who, coming, closed his eyes in final sleep.—*Chronicle* (*Seattle, W. T.*)

THE BRITISH PRESS ON INDIA WHEAT.

Commercial papers of London, of recent date, commenting upon the fall in the price of wheat in the United States, so far as it has been influenced by stories of the alleged increased production of the cereal in India, express the opinion that the Americans are becoming unnecessarily alarmed. Some of the best English commercial authorities assert that there is no good basis for any reasonable expectation that India will within a generation become a formidable rival to the United States in the supply of wheat. The reasons given are the very inferior quality of Indian wheat as compared to good American standards, the inefficient character of Indian labor, the general indisposition of the Indian people to raise any more grain than they are compelled to for actual wants, and the lack of farm machinery and the difficulties attending all efforts to introduce and popularize modern farming implements among the people. It is contended that these difficulties will never be entirely overcome, and that all efforts to make India produce cereals for speculative export will fail to secure results enough to justify decreased acreage in other wheat-yielding countries.

YEAST—TWO RECIPES.

VIRGIN MALT YEAST—HAIG'S PATENT.

1 lb. hops, 2 oz. quassia chips, and 7 imperial gallons water are mashed for twenty minutes, then boiled for ten or fifteen minutes, and strained, cooled down to 170 deg. Fahr., and 12 lbs. malt stirred into the infusion; this, after mashing for 15 minutes, has the malt grains separated or pressed out, and the liquor allowed to cool down to and kept at the temperature at which fermentation—spontaneous (not below 76 deg. or over 80 deg.)—will be carried on.

This is the virgin yeast.

Fermentation will or should begin in from eighteen to twenty hours, and continue after that sixteen to twenty-four. When at its full height, take from the top half-a-gallon and place it in a close jar, in which place also 1 oz. or less bicarbonate of soda, and then cork air-tight and keep in a cool place.

This is a store for next brewing.

In Haig's patent yeast, when for bread, the quassia chips must be left out, else the yeast will be far too bitter.

BANBURY YEAST; OR SO-CALLED "PATENT."

9 gallons water, ½ lb. hops, ½ lb. bruised ginger. Let these simmer 3 hours, then strain off, and when cooled to 160-170 deg. Fahr. stir in 7 lbs. malt. Mash for three hours, strain and well squeeze the malt grains. When the mash liquor has cooled to 70-76 deg. start fermentation with one gallon of "patent" (this is patent) yeast, and 8 lbs. flour. Next day put into a cask and bung close.

This yeast is used with ferment, one quart (2½ lbs.) to the sack, nine hours from time of starting ferment to setting sponge.—*Millers Gazette* (*London.*)

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

OFFICE, NOS. 116 & 118 GRAND AVENUE, MILWAUKEE.

SUBSCRIPTION PRICE—PER YEAR, IN ADVANCE.

To American subscribers, postage prepaid.....$1.00
To Canadian subscribers, postage prepaid..... 1.00
Foreign subscriptions..... 1.50

All Drafts and Post-Office Money Orders must be made payable to E. Harrison Cawker.

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[Entered at the Post Office at Milwaukee, Wis., as second-class matter.]

MILWAUKEE, MAY, 1884.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. *You will thereby oblige not only this paper, but the advertisers.*

81,888.

A $50,000 BOND.

We have received the following communication from S. H. Seamans, Esq., Secretary of the Millers' National Association:

MILWAUKEE WIS., April 19, 1884.

EDITOR UNITED STATES MILLER, MILWAUKEE, WIS.

In response to the request of the Sub Executive Committee, the Geo. T. Smith Middlings Purifier Co., of Jackson, Mich., have filed in this office their "Bond of Indemnity," in the sum of fifty thousand dollars, (with names of three of the wealthiest citizens of Jackson as sureties), to protect and indemnify our members against any and all claims that may be brought for infringement of what is known as the Gilbert Sieve or Starch Patent No. 81,888, recently sustained by the District Court for the Western District of New York.

In acceding to the request of the committee the Geo. T. Smith Middlings Purifier Co. have given us additional evidence that they not only furnish a first-class machine, but will protect purchasers in their use.

Respectfully,

S. H. SEAMANS,
Secretary.

The following is a copy of the bond furnished, the sureties on which are reported worth over two and a half millions of dollars:

KNOW ALL MEN BY THESE PRESENTS, That we, the GEO. T. SMITH MIDDLINGS PURIFIER COMPANY, of Jackson, Michigan, a corporation under the laws of said state, as principal, and William D. Thompson, Alonzo Bennett and William H. Withington, in the said County of Jackson, in the state of Michigan, as surety, are held and firmly bound unto STEPHAN H. SEAMANS, *Secretary of the Millers' National Association*, and to his successors in office, in the just and full sum of Fifty Thousand Dollars, lawful money of the United States of America, to be paid to the said Stephen H. Seamans, as such secretary, or to his successors in office, in trust, nevertheless for the use and benefit of the individual members of said association, to which payment well and truly to be made the said corporation binds itself and its successors firmly by these presents, and to which payment, well and truly to be made, the said surety binds himself, his heirs, executors and administrators, and each and every of them firmly by these presents.

In witness whereof the said corporation has hereunto subscribed its corporate name, and affixed its corporate seal, and the said surety has hereunto set his hand and seal, this 14th day of April, A. D. 1884.

Whereas the above bounden corporation having expressly warranted all middlings purifiers sold by it, at any time, to members of the Millers' National Association, aforesaid, and guaranteed at the time of such sale, to defend them against any infringement of any letters patent, and being desirous of selling its middlings purifiers to members of said Association upon the same conditions, the condition of this obligation is such, that, if the above bounden corporation shall well and truly indemnify and save harmless any and every member of the Millers' National Association, aforesaid, who has already or may hereafter purchase middlings purifiers from said corporation, from all harm, damages, costs, suits, actions, judgments and executions that shall or may at any time arise, come or be brought against him, or them, or any of them, for any infringement or alleged infringement of certain letters patent, numbered 81,888, issued to J. J. Gilbert, and bearing date about the 8th day of September, 1868, for starch separator, without any fraud or other delay, then this obligation to be void and of no effect, otherwise to remain in full force and virtue.

THE GEO. T. SMITH MIDDLINGS PURIFIER CO.,
BY GEO. T. SMITH, *President*,
GEO. S. BENNETT, *Secretary*.

ALONZO BENNETT. [SEAL]
W. D. THOMPSON. [SEAL]
W. H. WITHINGTON. [SEAL]

Signed and sealed in presence of
WM. H. DICKEY,
WM. K. GIBSON.

This prompt action will not only renew, but greatly increase, the confidence of the milling public in the Geo. T. Smith Middlings Purifier Company. It is setting a good example, that other manufacturers may follow with profit to themselves, for in these days of patent litigation millers want to feel secure when they buy patented machinery.

JONATHAN MILLS, the well known inventor of flour milling machinery, is now with the Cummer Engine Co., of Cleveland, O.

MESSRS. C. H. Walcott & Co., of Indianapolis, Ind., are placing a new wheat cleaning machine on the market, known as *Teetor's Combined Grain Scourer, Polisher and Brush.*

THE RIVERSIDE CABLE CODE published by the Riverside Printing Co., Milwaukee, Wis., has been prepared for the especial use of the milling industry and commission merchants. It is pronounced by able judges to be the best Cable Code in print. Price $2.00 per copy.

THE advantages of manufacturing to a city by disbursement of wages is nowhere more manifested than in Milwaukee. The wages paid at the Bay View Iron Works—part of the North Chicago Rolling Mill Company—for 1883, was $458,637. The amount paid out for labor only, at Bay View since March 1878, when the N. C. R. Mill Co. took possession of the works, to Jan. 1, 1884, was $4,064,233.05.

A MACHINE has been invented at Pittsburg for the manufacture of hob nails, the work hitherto having been done by hand, and a factory will shortly be established. It is claimed that the machine is capable of doing the work of 100 men, and as the manufacture of hob nails by hand is engaged in by thousands of men at present, the invention will result in throwing out of employment a large number of men throughout the country. Each machine is operated by three men, and has a capacity of a ton per day.

THE *Northwestern Miller* says: Out of the twenty-three flour mills in Minneapolis, only two are exclusive roller mills—that is, mills that do not use millstones. In overhauling the third quarter of the Washburn A, recently, Head Miller McDaniels saw fit to put in four runs of stone. The millers, however, running the two mills which have all rolls, seem to be well satisfied with their machinery. In this connection a remark occurs to us which was made within our hearing a few days ago by a second miller. Said he: "There is Jim ——, who used to run this mill (we have rolls and stone); he was always in for all rolls. During the past year he has been in charge of an all-roller mill. The other day he was in here and casually remarked that what he needed was 'about four runs of buhrs.' This all-roll craze is very well in theory, but it won't stand in practice."

THE CASE MANUFACTURING CO., have recently taken out thirteen patents on mill machinery and processes of making flour. The inventions cover broadly the "Vibratory Automatic Feed" on rolls, which is beginning to be regarded as the only perfect feed. They also cover in one of their patents a machine for splitting the wheat, and separating the germ, seam-dirt and broken wheat, all combined in one machine. These patents will form the basis of extensive litigation without doubt, as some of them cover broadly machines which are being built extensively by others besides the Case Manufacturing Co.

The Case Manufacturing Co. are doing a very large and prosperous business, their machinery giving good satisfaction wherever used. Judging from the patents referred to above, the Company doubtless intend soon to increase their line of machinery by adding other specialties of great value. We shall take pleasure in giving our readers full particulars as soon as we can.

THE ROBERTS PATENT.

The Wheat Meal and Break Purifier Co., of Washington, D. C. are now the owners of a patent issued July 10, 1877, to Charles M. Roberts, the broad claim of which is that "*the device covers any method of manufacturing flour which subjects at any stage, or steps, of the comminution of the berries, the entire mass of meal, chop or groats before bolting, to the action of air currents for the purpose of purification.*"

The operation was introduced soon after patenting into the Greenfield Mills, Md.; the Columbia Mills, Georgetown, D. C.; and at the mill at Maysville, Ky. The patentee, Roberts, died in Indianapolis, Jan'y, 1881, while in the service of The Nordyke & Marmon Co. Subsequently the owners of the patent introduced it in a Minneapolis mill. They claim that the millers are infringing their patent, and propose to make settlements with them for a reasonable consideration, and avoid going to law. The matter has been submitted to the Millers' National Association's committee on patents, and a report will be made in due time. We do not know whether a sound claim for infringement can be sustained on this patent or not, but it is certain that it is being fully investigated, and that a legal opinion will be soon rendered.

PHILADELPHIA, at the present time, is the largest manufacturing city in the world, not excepting Manchester, England. The number of its manufactories are said to exceed 30,000, and the number of the operatives in various occupations are computed at 200,000.

MAN SHOULD UNDERSTAND THEORY AS WELL AS PRACTICE.

[An interesting paper read by J. S. Salisbury, before the Practical and Mechanical Engineers' Society of Chicago, March 28.]

No man can be said to be a practical workman unless he thoroughly understands the theory as well as the practice of his employment. Some men are content in the simple accomplishment of results without endeavoring to study the whys and wherefores which lead to their production. Such workers accept without investigation the formulas of their trade, and do not aspire to a knowledge of the principles upon which these formulas rest. They may be very good artisans in their way; they may, so far as their immediate tasks are concerned, be excellent workmen, but it is needless to say that they are not composed of the material which makes the great, the rising, and progressive spirits of the age. A very interesting and instructive controversy arose a few months since in an English periodical between a Sheffield steel-worker and one of the leading English metallurgists. The former contended that the steel-maker who had learned the expert manipulation of steel in the works was a higher authority on the question of steel-working than the men of science, who, although they could analyze the steel which the Sheffield workman produced, and could tell him to an exactitude how much carbon it contained, and what physical tests it could withstand, yet could not in actual practice vie with him in producing a finished quality of that most beautiful and serviceable metal. The steel-maker insisted that the shop-knowledge was more useful in a practical way than the knowledge procured from scientific treatises and in the laboratory. The metallurgist replied that however expert the steel-maker may have become, his knowledge of the art at best must be limited, and that however good a workman he now was, he would still be better were his practical knowledge supplemented by a wide course of scientific study.

Practical men are too often inclined to look upon scientists as mere theorists, whom it is dangerous to follow, as though they were false teachers or mere visionaries. Perhaps there is a foundation for this belief. Many professing to be scientific teachers have shown themselves to be totally unfitted for their work. Lacking a proper education, or failing in making a proper application of the facts at their command, they have proven indeed "blind leaders of the blind." But these are not true scientists, and they should no more be mentioned as representatives of the schools of science than should the merest amateur painters be mentioned as fit representatives of the schools of art of which a Rembrandt or a Story were worthy and illustrious disciples.

The Sheffield artisan who would assert that Sir Henry Bessemer or a Siemens could not teach him something new in the art of steel-making would be set down as a foolish egotist. He might know how to forge a piece of steel into an artistic form, but he probably would not be able to tell what physical changes his process of forging has wrought in the piece of steel under manipulation. This Bessemer or Siemens could do, and could tell him also the limits of danger in the matter of too much or too little heating, or too heavy or too light forging. Perhaps the steel-worker has learned these things in part, but he may have studied only comparatively few of the changes which the material he is engaged upon undergoes, and hence when a new line of experiences is opened before him he is not able to successfully cope with it, until he has mastered the secret in that oldest of all schools, the school of experience, the tuition in which, we are told, is so exceedingly costly.

Nature's laws are exact, unchanging, universal. Once discovered, they are serviceable at all times and in all places. Two and two will always be four the universe over. The fact that the presence of phosphorus in certain quantities in steel is deleterious is a rule which will never change, and so with all the principles underlying the science of physics and chemistry, they are positive and unchangeable truths, the discovery of which is of the highest importance to both the theorist and the man of practical experience.

The chemist is the right-hand man to the steel-maker. The one studies the steps and analyzes the productions of the other. He fathoms the mysteries of nature and opens new avenues in which the practical worker may accomplish his aim.

The machinist, in attempting to dress a certain casting, finds that his tools grow rapidly dull or easily break. He at once seeks the cause. Before him is the effect—broken or dulled tools. To find the remedy he must know the cause. Does he look for this alone in his shop? He may not find it there. Another casting upon which he works may not produce a like result. What does he do? He goes to the foundryman and ascertains, if possible, how the casting was made, and of what it is composed. Finding that it has too tough a skin, he will, if desirable, have his foundryman make a change either in his methods or in the materials of which the casting is composed. To ascertain how to properly order this change the aid of the metallurgist must be sought and the hand of practice must be assisted by the hand of science.

Do you say this course is not practical? It is pursued every day, not alone in the making of castings, but advice of the scientist is brought into requisition in every branch of industry. Take the case of the manufacture of steel. Orders are sent to the steel-maker for a certain use, and he makes his steel to correspond with such use. I quote from a recently published work on "Steel." The author says: "Every steel-maker worthy of the name knows exactly what temper to provide for any tool, or if it is a new case, one or two trials are enough to inform him, and as he always has all of his twenty odd tempers on hand, it is just as easy, and far more satisfactory to both parties, to have it made right than to have it made wrong."

Prof. Dudley, the chemist of the Pennsylvania road, after making a series of elaborate experiments, including every species almost of chemical and physical tests, has come to the conclusion that the proper thing to do, even in ordering steel rails, is to prescribe what percentage of carbon, manganese, and other properties they should contain; and while this is a somewhat open question, it goes to show that scientific information is the pathway to the best practical knowledge.

Can this be disputed? Will the mere engine tender place himself above Watt, or Stephenson, or Corliss, or the score of modern engineers, whose wonderful mechanical productions are the marvel of the age? Will the ordinary machinist, even though he may be an excellent workman, place himself above such master-spirits in the mechanical world as Clement, Maudslay, Sir Joseph Whitworth, or the many noted American machinists, represented by such establishments as that of Brown & Sharp, William Sellers & Co., and Pratt & Whitney?

What are the stepping stones to progress in the mechanic arts? Certainly not mere practice. Intelligent study and observation lead to higher results. The mechanic or artisan who would rise must study causes as well as results—must learn principles as well as methods—must look beneath as well as upon the surface of his work. The mechanic who scoffs at science, who abhors study, who seeks only for present accomplishments, who thinks that all there is in work consists of turning out the job before him, and who cares not to ascertain how that work may be improved, or better substituted, will always lag in the race of progress. He may cling tenaciously to his rule of thumb methods, but he will see his brighter and more studious companions rise above him.

It is not contended that a study of the sciences will accomplish everything desired. The schools of science may be said to be in their infancy. Every day reveals some new law to the metallurgist. Every year we find new processes developed in all the arts. The technical journals are teeming with information of new discoveries, and registering new achievements in the world of letters and of science. Railroads, steamships, telegraphs, telephones, electrical apparatus, are all modern. But what of that? Because we cannot see a thousand miles shall we refuse to open our eyes to the beauty that is about us? Shall the humble workman refuse to study the books of science, because he may never know as much as Herschel or a Bacon? We should all remember that the world is filled with truths. They are written in the rocks, in the sunlight, in the clouds, on the ocean's waves, and in the foliage of the trees. The air we breathe is an exponent of nature's laws. We may not grasp all these laws, nor learn all of the truths which fill the universe, but this does not signify that we should glean none of them. One principle discovered by the simplest learner is as much his as though he were a savant or a prince. Could I speak to every worker in the land I would say study. Study thoroughly and deeply. Follow the teaching of the master minds—go to the same fountains of inspiration from whence they drank. The road they have traveled is opened to you. Do not be content to plod along, aiming at simply copying the work before you, but look to higher accomplishments. Master your art. Learn the causes which promote success, and knowing where these causes lead, follow them to conclusion. Poverty is no bar to success in the fields of scientific research. Neither is a life of labor nor lowliness of station. Often the men who lead have been humble, poor and friendless. There is no aristocracy in nature. Nor is there favoritism there. As the scripture says, "Knock and it shall be opened unto you," so he who knocks at nature's door will find entrance and a feast.

[Written for the UNITED STATES MILLER.]

RYE MILLING.

(Continued from April number.)

Having described a mill most suitable for grinding rye, it only remains for us to make a few remarks about grinding and bolting. It is impossible to prescribe a method which will please every one, for many millers have their own peculiar ideas on the subject.

Kernels of rye are small and of a more uniform size than wheat kernels unless the latter is graded. When rye is ground on millstones which run parallel, the bran is peeled off almost whole, if the grain is in good condition. The positive distance between the stones does not pulverize the bran and only so much flour and fine middlings are produced as crumble off by reason of the breaking of the inside of the kernel.

After grinding send the resulting chop to a scalping reel with wire cloth, the upper half for flour and fine middlings and the lower one for coarse middlings. Let the bran tail over.

If the miller has a purifier for rye flour it is needless here to tell him how to use it, but if he has not got one, for this purpose he may build a cheap concern that will materially help him, in the following manner:

The drawing herewith, shows a kind of a blow-spout with a fan attached; *a* is the feed board with strips on it to spread the middlings as evenly as possible, from which it falls into the spout. The side boards may be about 1 foot wide, and the spout from 2 to 3 feet wide. The blast need not be strong. From *b* to *b* is the length of the side board, and the tail end from *b* to *c* is covered on the sides and top with cloth to let the air out and keep the dust in.

To arrange the hopper spouts to meet the ideas of the miller using this apparatus, it is best to make a full, board bottom, crosswise on the under side of the spout, of matched flooring, and fasten with screws, also the top board in the same way; then, set the fan in motion and let the feed run in until the bottom is filled up a few inches thick. Then, stop the feed and blast; take off some of the top boards and mark where the division may be made; make the same trial over again, with more or less blast, and according to the result obtained, put the hopper spouts under it. Of course it may be varied afterward at any time by giving more or less blast.

Where room is scarce the blow-spout may be placed up under the joist and fastened there on a few hangers, and the spouts leading from it directed so that they may be the most out of the way, perhaps near the wall. The work may be done by any joiner that has some knowledge of mill work. There is no patent on this device and all are welcome to it.

This device will do considerable separating and cleaning, as it will remove the fine bran particles and separate two kinds of middlings. The miller can operate on it separately if desired, or may grind it together. It will be of use even on wheat middlings if the miller is short of purifying capacity. If the middlings are run through this apparatus before it goes to the purifier more work can be done on the purifier.

The miller must use his discretion as to the amount of white flour he takes from the middlings. The more *white* flour he takes out the darker the second flour will be. This he must regulate according to the demands of his customers. The clear middlings flour will furnish bread almost as white as the ordinary bakers' bread made from wheat flour, and such bread properly baked and served in small loaves is simply delicious.

AREA AND CONDITION OF WHEAT.

The April returns of the Department of Agriculture make the winter wheat area about 27,600,000 acres. This is nearly the breadth sown of the previous crop, of which between 5 and 6 per cent. was subsequently plowed up, leaving 26,400,000 acres to be harvested.

Comparing with the area harvested, the present breadth is an increase of 5 per cent.

The present area is greater than that of the census year by more than 2,000,000 acres. The increase is about 1,500,000 on the Pacific coast and nearly 750,000 acres in the Southern States. There is a small increase in the Middle States and a slight decrease in the Ohio basin.

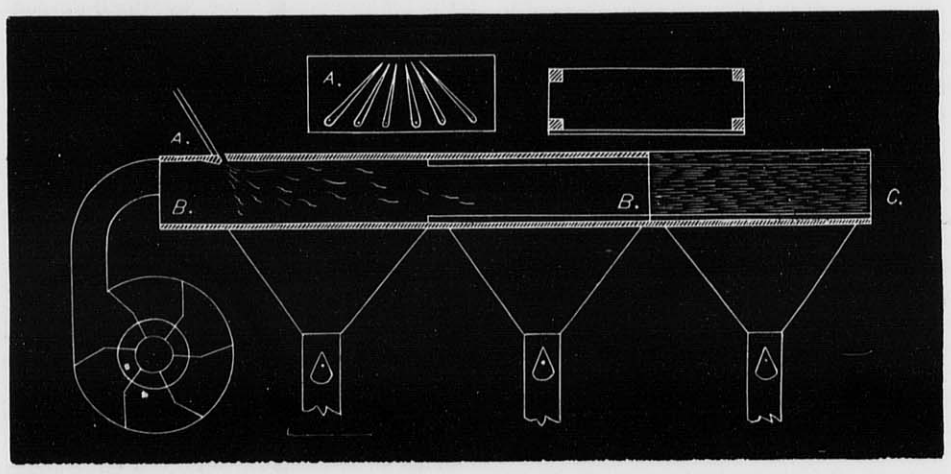
The condition of wheat averages 95, 100 representing a full stand, unimpaired vitality, and medium growth. In April, 1883, the average was 80, and 85 in April, 1881. The April average of the large crop of 1882 was 104. The State averages are as follows: Connecticut, 100; New York, 97; New Jersey, 95; Pennsylvania, 99; Delaware, 96; Maryland, 102; Virginia, 101; North Carolina, 102; South Carolina, 97; Georgia, 91; Alabama, 88; Mississippi, 92; Texas, 101; Arkansas, 81; Tennessee, 98; West Virginia, 100; Kentucky, 98; Ohio, 88; Michigan, 94; Indiana, 92; Illinois, 82; Missouri, 91; Kansas, 101; California, 101; Oregon, 102.

In Michigan, New York, and Connecticut the fields were protected with snow on the 1st of April, in some places a foot in depth. Subsequent condition will depend on the weather. No serious winter killing is reported except in Alabama. On low and wet areas some injury is reported throughout the entire breadth.

The superior condition of drilled wheat is attested almost without exception.

MULHALL'S DICTIONARY OF STATISTICS thus pictures the growth of manufactures of the United States since 1850: "Value of American manufactures in 1850, $1,060,000,000; in 1860, $1,970,000,000; in 1870, $4,230,000,000; in 1880, 5,560,000,000. In 1860 the value of manufactures per inhabitant was $61.75; in 1880, $110. In 1850 the number of persons employed in manufactures of all kinds was 957,000; in 1860, 1,311,000; in 1870, 2,054,000; in 1880, 2,739,000. In 1850 the wages paid were $254,000,000; in 1860, $400,000,000; in 1870, $805,000,000; in 1880, $990,000,000. In 1850 the capital invested in manufactures was $550,000,000; in 1860, $1,040,000,000; in 1870, $2,205,000,000; in 1880, $2,405,000,000. These statistics are taken from the census reports, and are approximately correct. At the present time the United States turns out more manufactured products than any other nation in the world—the total in 1880, as above given, being $5,560,000,000, while those of Great Britain were valued at $4,091,500,000 in 1882. By the same authority the total industries of the United States in 1880 were worth $11,405,000,000; those of Great Britain, $9,200,000,000; those of France, $6,840,000,000, and those of Russia, $4,650,000,000." These figures show how rapidly the country has progressed from an agricultural to a great manufacturing community; and the great fact remains that in this progression we have not lost our agricultural predominance. We have combined the two elements until now we are the great agricultural and manufacturing country of the world.

CHANGES IN FLOUR.—Balland discusses the changes of flour in a paper contributed to *Comptes Rendus*. He says that wheat contains a ferment which seems to be situated near the germ. This ferment is insoluble, and has the properties of organic ferment. It is able to endure a temperature of 212° Fahr., when dry, but is destroyed by boiling water. Both warmth and moisture are absolutely essential to its development and growth; a damp heat of 77° Fahr. is the most favorable. It acts upon the gluten liquefying.



In a properly constructed mill the greater portion of the ferment remains in the bran, and the better the flour is bolted, the less of the ferment it will contain. If the mill grinds too hard or runs too fast more of it passes into the flour, hence the changes noticed in what is called flour that has heated.

The acid noticed in old flour is not the cause of the gluten decreasing, but the result of it.

Investigations upon gluten have not yet cleared up its mysteries. It seems to contain variable quantities of water and there are certain substances, like common salt, which prevent its balling together; while others, like dilute acetic acid, directly favor it.

The gluten in flour heated to steam-heat retains its properties. The action of this ferment is retarded, but not prevented, by lack of water; as soon as water and heat are applied, it recovers its original properties.

The following conditions must be observed in making flour to have it keep well: It must be sound flour from hard, dry grain, which must be well hulled in properly constructed mills and thoroughly bolted. It must be kept in a place that is completely protected from heat and moisture. The French war department use air-tight metallic boxes for keeping flour in fortresses. Only flour from dry grain and the first grinding is used.

While engaged in this investigation the author has satisfied himself that the French military use the finest flour, to which, however, is added 12 to 18 per cent. from the second grinding, which corresponds to the legal requirements. This latter is a source of change, and yet we cannot entirely avoid making use of the second milling, for it is in the second grinding that the very nutritious portion of the grain is separated from the bran. But we can provide against this change by storing the two different qualities separately, instead of mixing them. The fine flour alone keeps well, and the other, which does not keep so well, is always used fresh, and the two mixed when used.—*Chem. Zeitung.*

NONSENSE.

IRISH WIT.—An Irish gentleman called on an eminent singing-master to inquire his terms.

"I charge two guineas for the first lesson; but only one guinea for as many as you please afterward."

"Oh, bother the first lesson then," said the other; "let us begin at once with the second."

Another native of the Green Isle exhibited an equal comprehension of economic possibilities when he went to have his bans of marriage proclaimed. In answer to the inquiry as to the cost, the registrar told him that the fees for being proclaimed in one day was ten shillings; for two proclamations it was five shillings; for three times it was half a crown.

"Bedad," said the Irishman, "but that's an illigant arrangement. You can just go on proclaiming me and Biddy till there's nothing to pay at all."

On another occasion at a military dinner in Ireland, the following was on the toast-list: "May the man who has lost one eye in the glorious service of his beloved country, never see distress with the other." But the person whose duty it was to read the toast accidentally omitted the important word "distress," which completely changed the sentiment and caused no end of merriment at the blunder.

TIRING HIM OUT.—*Mamma*—I met young Mr. Nicefellow on the street to-day and told him frankly that although he was welcome to come and see you, he should remember that you were young and needed plenty of sleep, and he therefore ought not to stay too late.

Nellie—And what did he say?

Mamma—He shocked me awfully by insisting that you kept him from going.

Nellie—Oh the great big story teller! I tried my best to tire him out, so that he would go home.

Mamma—Tried to tire him out! Why, how?

Nellie—By sitting on his lap.

ONE FLESH.—*Doctor*—Have you got the better of the ague yet?

Patient—No, sor. Me and me wife is as bad as iver, sor.

Doctor—Did you get the whisky and quinine I prescribed?

Patient—Yis, sor; but it did no good at all, at all.

Doctor—That is strange! You took it according to the directions, I suppose?

Patient—Yis, sor; ye know a man and his wife are one.

Doctor—What has that to do with it?

Patient—Well, ye see, sor, bein' as we are one flesh, I tuk the whisky and gave Biddy the quinine.—*Philadelphia Call.*

HAVING made his will, Mr. Barnum was lately asked if he thought he would go to heaven when he dies. "I don't see why not," was the characteristic reply of the great advertiser. "I think I have the best show of anybody on earth."

A COLORADO LOCATION.—A prospector who struck a lead in the Gunnison country not long ago, posted the following notice: "The undersigned claims this lede with all its driffs, spurs, angels, sinosities, etc., etc., from this staik a 100 fete in each direction, the same being a silver bearing load, and warning is hereby given to awl persons to keepe away at their peril. Any person found tresspassing on this claim will be persucuted to the full extent of the law. This is no monkey talc butt I will assert my rites at the pint of the sicks shuter if legally Necessary so taik head and good warnin. Accordin to law I post This Notiss. —JOHN SEARLE."

DIDN'T STAND IN THE WAY.—"Of what did your father die?" asked the insurance examiner. "Dropsy," replied the young man, in faltering tones. "H'm," said the examiner, "hereditary?" The young man said he hoped not and nervously tried to change the subject, but was at last cornered and compelled to admit that his father had the dropsy out in Arizona, and that when he dropped he didn't get all the way down, and there was nothing for him to light on. But the insurance man seemed to be greatly relieved and said there was nothing in that to stand in the way of his getting a policy.—*Burlington Hawkeye.*

LIFE AMONG THE MORMONS.—"Are you going out this evening?" asked a Mormon lady of her husband.

"Yes," he replied. "I shall call on Miss Smith."

"I owe Miss Smith a call myself," she said, "but I don't suppose it would be exactly the thing for us to go together."

"Hardly," responded the husband.—*Philadelphia Call.*

IN A HURRY TO HAVE IT SETTLED.—"Is my husband any better?" she asked, intercepting the doctor in the hallway, on his way out.

"I think he is a little easier this morning."

"You can't say positively, I suppose whether he will live or die?"

"I cannot."

"Well, I'm sorry for that, because I'm a delegate to a woman's rights convention that meets next week, and I'd like to have the matter settled before I go."—*Brooklyn Eagle.*

EVIDENTLY AN OHIO MAN.—"Please, sir, can't you give me an old coat?" asked a mendicant of a wealthy merchant. As the mendicant had formerly been the servant of the merchant, the latter said:

"Go over to the clothing store and pick yourself out a $12 suit, and I'll come and pay for it."

The mendicant did as he was told. Taking the clothing store man to one side he said to him: "That old duffer sent me over to pick out a suit of clothes. Now, I want you to let me have my commission, so I, too, will make something by this little trade."

WILL PROBABLY HIT IT.—He was a Chicago manufacturer of butterine. He reached home from a trip down South, and entered his office with the remark to his partner:

"Smith, all is lost!"

"No! What's the matter?"

"Why, we have got to use at least 10 per cent. of pure butter in our article, or find ourselves driven from the Southern market."

"Is that all? Then cheer up. If we must increase the per cent. of butter from five to ten, let us find a substitute for the tallow. Let us experiment with asphalt or glue!"

THEY DISSOLVED.—Twenty years ago two Detroit attorneys, both of whom are still living to-day and pleading for criminals entangled in the meshes of law, were returning from Pontiac by the highway. About nine o'clock in the evening they were stopped by a highwayman some three miles from the city, and at the command of "Your money or your life" both shelled out. That is, one of the pair handed out two or three dollars in wildcat money, while the other was robbed of about $100 in gold and a valuable watch. Both were highly indignant, and the one who lost most at once set the sheriff after the robber and soon had him in jail. He had made the complaint individually, and a few days before the trial was to come off he remarked to his partner:

"I suppose I shall have to summon you as a witness. You can, of course identify the fellow?"

"N—o, I think not," was the reply.

"What! It wasn't a week ago that you said you could pick him out of 10,000!"

"Yes, but he has since employed me as his counsel, you see?"

"Would you take his case against me when you, too, were robbed?" asked the complainant, as his face grew whiter than moonlight.

"Why not? You've lost your money anyhow, while he will give me $75 to clear him. If you have any witnesses you'd better hunt 'em up, as we are prepared to prove an alibi."

When the trial was called the defendant had no trouble in proving by his own lawyer that it was a case of mistaken identity, and those attorneys have never spoken to each other since.—*Detroit Free Press.*

ONCE when thieves entered the rectory, taking everything of value that they could find, the clergyman found solace in the following epigram:

They came and prigg'd my stockings, my linen and my store;
But they couldn't prig my sermons, for they were prigg'd before.

AFTER A PENSION.—"Well, Pat," was asked of a recently-arrived emigrant, "and how do you like America?"

"It is a foine counthry, sor."

"Have you succeeded in getting work yet?"

"No, sor; but I have a frind in Washington who is after getting me a pension."—*Philadelphia Call.*

A. B. Kestler, Carroll, Ohio, has been contemplating changing to the roller system for some months past and after carefully investigating the different systems has placed his order with the Case Mfg. Co., Columbus, Ohio, for a full line of breaks, rolls, purifiers, etc., for a complete gradual reduction mill on the "Case" system. The mill when completed will have a daily capacity of 60 bbls. Mr. Kestler has been a very successful burr miller and we have no doubt but what he will meet with success on the system he has adopted.

UNITED STATES MILLER.

PUBLISHED MONTHLY.

OFFICE NOS. 116 & 118 GRAND AVENUE, MILWAUKEE.
Subscription Price .....$1 per year in advance.
Foreign Subscription.....$1.50 per year in advance.

MILWAUKEE, MAY, 1884.

HON. GEO. A. PILLSBURY, of the milling firm C. A. Pillsbury & Co., has been elected Mayor of Minneapolis, Minn.

ENGINEERS on the New York Central Railroad are forbidden to drink intoxicating liquor either when they are on or off duty.

MILLERS in need of grain-cleaning machinery should not fail to read the new advertisement in this issue, of the EUREKA MF'G CO., of Rock Falls, Ill.

THE prominence of the silver coinage question makes peculiarly timely the paper on "The Bank of England," which is announced for the May *Harper's*. It is to give a clear account of the history, features and functions of this centre of the financial world.

JESSE DORMAN, ESQ., formerly of *The Miller and Millwright*, of Cincinnati, and later of the *Denver Press*, called on us recently.

A CONSIDERABLE number of millers from different parts of the country are taking trips to the Pacific coast with a view of permanent location.

THE convention of American inventors has met at Cincinnati, organized and adjourned after making preparations to look after the welfare of the interests of inventors.

SOME foreign flour importers have recently complained of the poor quality of sacks in which American flour was received. It is poor economy to ship goods in poor packages.

THE following table gives the amount of starch contained in the different kinds of grain: Wheat 67.88 per cent.; Rye 64.65; Oats 60.59; Barley 66.43; Corn 67.55; Rice 88.65; Beans 37.30; Peas 33.00.

ARRANGEMENTS have been made to extend the Wisconsin Central Railroad from Chippewa Falls, Wis., to St. Paul, Minn., during the approaching summer. This will give Milwaukee another through line to St. Paul.

WE have received a copy of the 1884 catalogue of the Richmond Manufacturing Co., of Lockport, N. Y. It is a handsome one, and illustrates and describes perfectly the various kinds of grain cleaning machinery made by the Company.

EDWARD C. NOTBOHM, ESQ., called on us recently. He has just returned from a trip to the New England States, where he has been selling flour for the Eagle Mills, Milwaukee, of which Messrs. J. B. A. Kern & Son are proprietors.

THE Consolidated Middlings Purifier Co., of Jackson, Mich., have effected a settlement with the Dominion Millers Association on the basis of $80 per machine used by members. Canadian millers outside the Association will have to make the best terms they can with the Purifier Company.

THE *Northwestern Miller* very wisely urges that the United States Agricultural Department should be presided over by a practical farmer. We would further suggest that a Department of Manufactures be established. It will be done sooner or later, and in our mind, the sooner the better.

THE WESTERN SUPPLY CO., of Milwaukee, is furnishing to boiler users a safe and reliable article called the "Standard Boiler Purge." The manufacturers guarantee it to remove all scale without foaming or injury to the plates. We have been using it in our printing office for several months and it gives satisfaction.

SASKATCHEWAN wheat is having a boom this season. The fame of its productiveness in the fertile valley of the Far Northwest is known far and wide. It has taken the premium wherever shown as the best hard milling wheat. In many of the States it has been tested with marked success. It will have a far wider trial this year.

BROTHER PALMER, publisher of our esteemed contemporary, *The Northwestern Miller*, made us a pleasant call April 25. He is on his way, accompanied by his wife, to Europe, where he will arrive in time to be present at the meeting of the British and Irish Millers' Association. He proposes to return early in August. *Bon voyage.*

WE have received from the publisher, Wm. A. Harris, manufacturer of the Harris-Corliss Engine, of Providence, R. I., a book entitled "A Pocket Manual for Engineers," by John W. Hill, M. E. It is brimful of condensed facts and figures for practical use. All engineers and mechanics will find it of much value. The price is $1.50 per copy.

THE alarming outbreak of the cholera in India is causing the French maritime authorities to adopt precautionary measures of quarantine and vessel inspection. England and the other powers will no doubt do likewise, and no doubt, if the disease should become very serious, it will materially affect the exports of wheat from India for the present year.

JAMES RIDDELL, of Miami, Manitoba, says that wheat can be raised there for $2.40 per quarter (8 bushels) and can be delivered in Glasgow or Liverpool for $6.18 per quarter, which includes cost of production and transportation. Manitoba farmers believe that American wheat has little to fear from the competition of the wheat-fields of India.

IT is stated that a British steamer will be stationed in Hudson's Bay next winter to ascertain what difficulties will be encountered and what facilities will be afforded for commercial relations with the new Northwest. It will not be very surprising to hear a few years hence of grain and stock from the Nothwestern States and Territories finding their way through Hudson's Bay to European markets.

THE stockholders of the firm of Ganz & Co., Budapest, Austria-Hungary, met at Budapest, March 2, and a correspondent of the UNITED STATES MILLER furnishes us with some of the principal items in the report which was read at the meeting.

Ganz & Co. manufactured and sold during the year 1883, 21,721 large, chilled-iron railway wheels, and 10,359 small wheels; 3,270 crossings for railways; 1,772 roller-mills; 3,007,944 kilograms of sundry hardware articles; 1,909 cars for railways; 46 electric-light plants with 84 arc-lamps, and 4,987 incandescent lamps. The net profit was 509,218 florins ($212,175, after deducting $48,100 for depreciation of machinery. The shareholders received a dividend of 60 florins ($20) per share, the par value of a share being 400 florins. The present market value of a share is 1005 florins. This, together with the fact that the works are annually increasing in value, and the dividends constantly increasing, shows the great confidence the public have in the solidity of the firm. To the reserve fund has been added 149,868 florins and 20,000 florins to the fund for the benefit of disabled employes. Our correspondent says that the Ganz (Mechwart) Ring Roller Mills are built with belt drive when specially ordered. Patents were issued in 1875 to Adolphe Fischer and Adr. Mechwart for belt-drive for roller-mills, but Continental millers did not generally adopt it, believing that there was no advantage except in the matter of noise, and that gear-driven roller mills were more exact and gave better results. There is, however, a demand to a certain extent for roller-mills driven by belt.

A NEW GRAIN TESTER.

Nobbe, of Berlin, Germany, has invented a tester for measuring grain, by which the contents of a bag can be exactly determined without emptying it out. It also serves for taking samples from any part of the bag, that may be desired. The tester is thrust to the bottom of the bag, when by turning a knob at the upper end, three cavities on different parts of the stick are opened. If now the stick is shaken lightly, the grain enters these cavities and is withdrawn together with the tester. As it frequently happens that grain offered for sale in bags, is not throughout of the same quality, this apparatus may be used to great advantage.

UTILIZATION OF REFUSE IN MILLS.

At present the milling refuse is employed as food for cattle, but a thorough examination has shown that it contains a large quantity of starch, viz: refuse of wheat-flour 45 to 57 per cent., bran and middlings of rye 60.02 per cent., middlings of barley 66.4, and bran of the same 50.9 per cent. of starch. All these might with advantage, if not by themselves, at least mixed with corn, be used for the manufacture of alcohol; but, according to experiments already made, it would be necessary to soak them several hours in water in order to soften the considerable quantity of woody fibres which they contain.

MILL-STONE CEMENT OF MAGNESITE

For repairing damaged mill stones a cement made from magnesite in the following manner, is recommended:

Mix the required amount of burnt and finely powdered magnesite with a concentrated solution of chloride of magnesium to the consistency of stiff putty. Add to this two or three times as much crushed flint and knead the whole mass thoroughly. Clean the holes and fissures in the stone nicely and apply the solution with a brush. Then fill the holes with cement and beat it in thoroughly with a stick or a piece of iron. If the stones are warm from milling, the cement will harden in 6 or 8 hours; but when the stones are cold, the hardening process may be hastened by putting heated bricks over the cemented parts. If the fissures in the stone should be deep, they must be cleaned out as far as possible, and a thin cement, made without a mixture of flint, poured in and made to penetrate by pressing it in with a dull knife blade. If there is a large hole in the stone, it can be mended by filling it with thin cement, and pressing down a piece of flint, which fits the hole as closely as practicable.

FOREIGN DEMAND FOR AMERICAN GRAIN.

The President sent to the Senate, April 23, a report from the Secretary of State, in reply to a resolution of the Senate, requesting information as to the average production, consumption, exportation, and importation of wheat, rye, corn and cotton in foreign countries, their probable requirements of such products from the United States before the crops of the coming year are ready, and other information bearing on the question of the demand for the grain and cotton products of the United States. The Secretary, in his report, says: "The calculations and estimates submitted prove, so far as statistics can prove under the circumstances, that the stock of wheat on hand in Europe at the close of 1883 did not materially differ from the stock on hand at the close of the previous year; that the wants of Europe are as imperative and as great as they were in 1883, and that the demands upon the United States should naturally be as great as they were in 1883. How long Europe may or can draw upon her reserve stock, or what are the exact considerations which control the several countries, especially the United Kingdom, which may be said to regulate the wheat markets of the world, time only can develop." He also says: "Most liberal allowance for the wheat output necessary to the world's consumption shows that the United States should be drawn upon the present year for 177,000,000 bushels, in round numbers, against 198,000,000 bushels, from all other wheat-growing countries. It thus appears that the United States, instead of being controlled by, should be able to control foreign markets."

A LONG STRAIGHT EDGE.—An absolutely exact straight edge of more than thirty-six inches is a wonder of mechanism. One of six feet was not recently believed possible, although several had been made on different plans of web-like and truss construction. It has been claimed, however, that almost exactness has been secured by a straight edge twelve feet long. The appliance looks like an arched truss, the highest spring of the arch being only twenty inches in a length of twelve feet. The space between the cord and spring is filled with diagonal lattice work. Three of these straight edges have been made, one remaining in the establishment where built and two going to technical colleges. Each of them has been tested by each other, and proved to be practically perfect.—*Scientific American.*

THE WORLD'S WHEAT.

Gerold, of San Francisco, gives the following as estimates of the world's wheat production, in tons of 2,000 lbs. each:

Countries.	Tons.
United States (Pacific Slope).. .. 2,000,000 United States (proper).....13,000,000	15,000,000
France	9,050,000
Russia	7,200,000
India	6,300,000
Italy, Spain, Algiers	6,000,000
Austria-Hungary	3,500,000
Great Britain	2,000,000
Germany, Holland, etc	2,200,000
Ottoman Empire, Roumania, etc	1,400,000
Australia, New Zealand, etc	900,000
Canada	780,000
Egypt	600,000
Chili, Peru, etc	570,000
Argentine Republic, La Plata, etc	400,000
South Africa, Brazil and sundries	500,000
Total	56,400,000

While the United States can spare fully one-third of its wheat for export, requiring only two-thirds for home consumption, the total annual requirements of the countries of Europe above their own production are about 3,900,000 tons for the United Kingdom, 2,600,000 tons for France and 3,800,000 for other European states—i. e., in all, 10,000,000 tons. Of the latter quantity over 60 per cent. (i .e., 5,800,000 tons) was furnished so recently as 1881 by shipments from the United States and the remaining 40 per cent. (i. e., 4,200,000 tons) was furnished by Russia, Australia, India and other countries.

DANGERS OF MOLDY BREAD.—A singular case of poisoning from eating a pudding made in part of moldy bread is reported in the *Sanitary Record*. The main facts of the case may be briefly stated as follows:—The principal materials of the pudding consisted of scraps of bread left from making toast and sandwiches, and they had been about three weeks accumulating. To these scraps were added milk, eggs, sugar, currants and nutmeg. The whole was baked in a very slow oven and was subsequently eaten by the cook, the proprietor of the eating house in which it was prepared, the children of the proprietor and two other persons. All of these became violently ill, with symptoms of irritant poisoning. One of the children (aged three years) and one of the adults died. The necropsy of the body of the child caused the medical men to suspect poisoning, and accordingly the viscera, together with the remnant of the pudding, the materials used in making it, the matter vomited, etc., were sent to a chemical analyst, Mr. Alfred Allen, for examination. He made tests for several poisons, but without positive result. A puppy was fed with the pudding for two days without any poisonous effect. He was then led to look for ergot in the pudding, and was soon startled to find unquestionable evidence of its presence, as far as the chemical reactions went, though he was unable, with the aid of the microscope, to detect any actual ergot. From these facts Mr. Allen infers that the reactions hitherto supposed to be peculiar to ergot are common to other poisonous fungi.

[Written for the UNITED STATES MILLER.]

HON. ABRAM S. HEWITT AND AMERICAN LABOR.

By JOHN W. HINTON, of Milwaukee.

No member of congress has been more prominently before the American people, as an advocate of free trade, for some time past than has the Hon. ABRAM S. HEWITT, who occupies the dual position of representative and manufacturer.

His respectable connection, as the son-in-law of the deceased Peter Cooper, the great American protectionist and philanthropist, give to his utterances, more attention than they would otherwise command. Mr. Hewitt is now rarely correct, never logical, his mind having changed so much, that his assertions are contradictory and diametrically opposite to his statements of a few years ago. If a physician was called to diagnose his case he would term it "mental aberration," and that his patient was laboring under a species of lunacy.

We are not censuring Mr. H. for this peculiarity of his present condition; it is well known that all sublunary bodies are liable to mutation. We simply note the changes.

Mr. Hewitt in his speech March 26, 1884, in the House of Representatives, says:

"At the present day not a single enlightened nation, not a single commercial nation, proposes or imposes taxation upon the work of production, except the United States."

The speech, from which the above extract is made, was delivered on the "whisky extension" matter. *In vino veritas* is an old adage, does a discussion about whisky have a contrary effect?

The facts are that there is *not* a single enlightened nation, *not* a single commercial nation: but what *does* "impose tariff taxes upon the work of production" of other countries, whenever they arrive at the port of entry of that country to compete with the labor of that country.

Even England taxes raw materials, products not yet manufactured, lightly, it is true, but her tariff duties increase rapidly, as that raw material is partly or in whole manufactured. Mr. Hewitt, while discharging his free trade fireworks, drew largely on Dr. Squibs in favor of "abolishing the whisky tax," making no allusion to England, to some extent "an enlightened and a commercial nation," who possibly to please Mr. Hewitt, will alter her tariff and by and by let in our whisky free, that is, remove her import tax upon our "work of production."

Mr. Hewitt says:

"Any mode of discussing a revenue measure which does not refer itself to economic principles is out of place, all appeals to sentiment, to passion, to emotion, are a mistake." * * * "But taxation looks not to charity or morality. It looks to certain economic principles which have been settled by the experience of mankind and are written on the pages of the history of the human race."

Mr. H. continues:

"When taxation is imposed upon the materials upon which human labor exerts itself, then it is a direct tax and imposition upon the work of production. Hence in England, in France, in Germany, in Italy, in every country that holds a conspicuous place in the progress of modern civilization, raw materials are admitted as free as the air which the people breathe. But here they are met by obstructions the moment they come within the marine league—within the sight of this land of free thought and free government."

We are sorry to differ with Mr. Hewitt, but no one knows better than he does, that, if he should attempt to take a barrel of that "whisky" he alluded to into England, in the night time, or even the day time, he would have to do one of two things, either pay the duty, the tax, on it, or have it confiscated and himself be liable to arrest, fine or imprisonment for "attempting to defraud her Britannic Majesty's revenue."

Such is the "economic principle" pertaining to American whisky on its entrance into England.

As to whether the laws of England, the taxes on whisky, are founded on "charity or morality," Mr. H. can determine for himself. Certainly they have been "settled by the experience" of English statesmen and "are written on the pages" of her acts of parliament.

And whenever Mr. Hewitt makes the attempt to land his American whisky on the coast of England, even should his frail barque escape the vigilant eye of the coast guardsman stationed on Shakspeare's Cliff near Dover, who, with a powerful spy-glass, continually sweeps the channel to detect attempts at smuggling, he would be "met by the obstructions" of a revenue cutter, that would speedily take care of Mr. Hewitt and his American whisky. And after Mr. H. had paid the duty and was desirous of treating his friends of the Cobden Club with "Bourbon" from a silver goblet of American make, he would find that free trade England would tax him "thirty-seven and a half cents an ounce" for the privilege of taking that goblet into England.

To show how Mr. Hewitt has changed his views, we append a couple of extracts from his report as U. S. Commissioner to the Paris Exposition in 1867. Speaking of the condition of labor in Europe, he said first of France:

"It requires the utmost economy on the part of the laboring man and the united labor of his wife and children to keep his family in existence; and it is the accepted rule and practice for such a family to have meat but once a week; and any change in this condition of affairs, involving a change in the remuneration paid to the common laborer, wou'd put it out of the power of the iron-masters of France to carry on the business in competition with Belgium and England in the absence of a higher tariff on imports. The existence of the iron business in France, therefore, as a national branch of industry may be said to rest upon the elementary condition of giving meat once a week only to the great mass of laborers who are engaged in production.

In Belgium substantially the same state of affairs prevails."

Mr. Hewitt reported of the labor in Wales, England and Scotland.

"As a general rule, the labor of the women and children is required in order to eke out the subsistence of the family. In Wales, women are extensively employed in the works, doing the labor for which a man would be required in America, and earning from ten pence to one shilling three pence per day, or rather less than half the wages that would be paid to a man for the same amount of labor, which they perform equally as well.

"In Staffordshire, and in the North of England and in Scotland, women and children are still extensively employed above ground about the mines and around the coal heaps at the mouth of the pits, the substantial result of which is that the labor of the whole family is procured for the sum of which would be paid to its male head if he alone labored for the support of the family, of course at a far lower cost in the resulting production of iron than would otherwise be possible. * *

"But if the women and children were altogether drawn from those occupations, as they are in the United States, it would not be possible to produce iron except at a considerable advance in the price of labor."

Significant indeed is that last sentence: "if the women and children were altogether drawn from the manufacture of iron in England." In other words, if "charity and morality" governed the labor of England as it does the labor of America, and women and children were kept from such brutalizing labor as they are in America, English iron would cost more to make it, because of the "considerable advance in the price of labor."

Now what did Mr. Hewitt say in his letter to Jay Gould, January 27, 1870, three years after his report as United States Commissioner in 1867:

"Free-trade will simply reduce the wages of labor to the foreign standard which will enable us to sell our rails in competition with foreign rails. But as a matter of course, the ability of the laborer to consume will be reduced, and a serious loss will be inflicted on commerce and general industry, and the business of railways especially.

The only reason why a tariff is necessary is to supply the laborer with such wages as will enable him to travel and consume not merely the necessaries but some of the luxuries of modern civilization."

It would seem that the sympathy which Mr. Hewitt had for the American laborer in 1870 has "gone where the woodbine twineth." Then again, it is well to remember what Mr. Hewitt said to a gathering of working men in Trenton, New Jersey, while smarting under disappointment, because an English agent—owing to the "cheap labor of men, women and children in England making iron"—underbid him and got the contract:

"I have lately been in New England for the purpose of securing a contract for rails, in order to keep the mills running after our present contract runs out. I offered to make the rails at the very lowest at which they could be made at the present rate of wages. An English agent came there, and underbid me, and got the contract. *Thus for the want of a protective system is the money sent to England, to employ English workmen, that ought to have come here to employ you.* Establishments properly located, and managed with proper skill and economy, have been compelled to suspend work throughout the land."

It may seem harsh to say it, but we are almost forced to the conclusion that Mr. Hewitt, himself an American manufacturer of iron and steel, is desirous of forcing down his American laborers to the condition of those of France, etc., where, as he said, and that from his own personal observation, "the existence of the business rests upon the elementary condition of giving meat once a week only to the great mass of laborers who are engaged in its production."

"Nor ought we to be charged with want of charity or morality," after reading Mr. Hewitt's exposition of his "economic principles," if we incline to the belief that the gentleman would be delighted at the labor of Trenton being so low that similar advertisements could be read at his breakfast table as the one in the Dublin *Freeman's Journal* appearing January 15, 1882:

"WANTED.—Strong, humble girl to assist in minding children and going of errands and messages; age, 15; 8s per quarter. Apply at 59 Harcourt Street, 11 o'clock to 2 Monday."

Sixty-four cents a month for a girl's wages, fifteen years of age, humble and strong—how particular as to qualities!!

Sad will be the day in America when such girls—through Mr. Hewitt's free trade theories, which he avers are void of "charity or morality"—have to work for sixty-four cents a month, or *about 2 cents a day!!!*

Mr. Hewitt says:

"As a pig iron maker, knowing its vast uses, I am at a loss to-day to say whether the production of iron, or the production of alcohol, is the most useful to the human race. Yet if any man to-day were to propose to impose a tax upon the manufacture of pig iron, he would be hooted, etc., etc."

Mr. H. has the faculty of being mysteriously funny at times, and, to offset his allusion to pig iron, we quote what was said by a member of the British Parliment and a member of the Cobden Club also, about three years since, at a meeting in Manchester, England:

"*If America would remove her tariff of 29s 4d on our iron, we should be able to close every iron work east of Pittsburg within three months.*"

(The duty on a ton of foreign pig iron was then seven dollars.)

Mr. Hewitt says:

"The Constitution under which I have been brought up, and have sworn to obey, declares that taxation is for revenue and for revenue only."

Has Mr. Hewitt overlooked the fact that of the enactors of the Tariff Act of July 4th, 1789, which was introduced by James Madison, and was for the "encouragement and protection of American manufactures" eighteen were members of the convention which formed the Constitution, ten Senators and eight Representatives.

Nor ought Mr. Hewitt to forget the fact that the framers of our Constitution publicly announced to the world that they were guided by "charity and morality," stating:

"Let it be remembered that it has ever been the pride and boast of America, that the rights for which she contended were the rights of humanity."

As we have said many times on the rostrum, we repeat here:

Our government was formed in violation of all known governmental precedents or economic principles in use among rulers. From no known hypothesis, professor's or doctrinaire's, did it spring or was it born. It was simply and solely the practical application of human rights under human government, for the protection of human beings.

"The laborer of the United States is the United States," as Daniel Webster so tersely and truthfully put it. To the guardianship and protection of our labor do we owe our prosperity, our greatness, our strength and our riches, to which the Lord Chief Justice of England bore his testimony about six months since:

"It is not your collossal fortunes that have interested me; I can see them at home. What I do admire, what I long to see and never shall see in my own dear England, is what may be called your upper and lower middle classes. I have seen among them men who would do credit to any capital in the world. I have seen tens of thousands of houses occupied by the owners of them. I am told that in general your farmers own their farms, your cultivated gentlemen own their houses, and your artisans own their cottages. What a state of satisfaction and content this produces in time of peace! What an irresistible force in time of war!"

Such are the results of American economic principles, as enacted by American legislators. In conclusion, we commend to the consideration of Mr. Hewitt the grand utterance of James A. Garfield, of which the venerable Peter Cooper said, it was truly American:

"We legislate for the people of the United States and not for the whole world, and it is our glory that the American laborer is more intelligent and better paid than his foreign competitor."

And we particularly call Mr. Hewitt's attention to the last public speech ever made by Mr. Cooper, presiding over a meeting called in the interests of American Labor, at the Cooper Institute, New York, Feb. 1st, 1883. Therein occur these words, uttered in his ninety-third year:

"These advocates of free-trade propose that our mechanics shall either work at the starvation wages of foreign laborers, or be forced to abandon their trades and become competitors of the agriculturists of our country. * * * * *

"I have noticed in my own business life, extending over a period of nearly seventy years, that every reduction of the tariff has brought wretchedness and ruin. It is the natural effect from such a cause. Nothing is more certain than that the advocacy of free-trade comes from foreigners who want to break up our industries. They have done it several times and they want to do it again. * * * The laborers of the Old World get barely enough to keep body and soul together, and that is the condition in which the advocates of free-trade are trying to place our laborers, and it behooves every man to do all he can to deter Congress from the endeavor."

INDIA WHEAT.

Mr. Wm. Dresbach, a prominent exporter of California wheat, expresses the opinion, as quoted from the *Herald of Trade* of San Francisco, that the soil and climate of India cannot be adapted to its successful culture for many years, owing to the fact that it is impossible to harvest wheat grown in the largest districts without more or less of a black adobe getting in it that it is impossible to separate unless by wetting, which is rather expensive, and will always cause it to sell for less than does wheat grown in countries to which that grain is indigenous. He also claims that it will not keep, as it soon becomes weevilly, and in a few months is so eaten as to blow away. There is no questioning the fact that dirt is liberally found in the India product. The Bombay Chamber of Commerce are endeavoring to solve the matter. It stated in its communication to the Indian government, that they were unable to say whether any adulteration goes on by the buyer of the crop after it is reaped, but they were inclined to think such was the case. By way of correcting this dirt trouble the Bombay government recommends that prizes be distributed to those farmers who cultivate the grain in the most approved manner, and whose crops are freest from dirt.

PREVENTING CORROSION AND SCALE IN BOILERS

A paper on this subject was read at a recent meeting of the Society of Arts by Mr. G. Swinburn King. After some preliminary remarks, Mr. King stated that it had long been suspected that "galvanic action or electricity in some form had to do with corrosion and pitting." He then mentions the various theories on the subject, and alludes to the numerous patent compounds for curing these evils, remarking that "some compounds cure one part of the evil, and do not touch others, while some, again, are extremely dangerous to use in a boiler under steam pressure." The author then refers to the results of the labors of the committees appointed by the Admiralty between 1874 and 1880 to inquire into causes of decay in the boilers of her majesty's ships. "The main conclusion," he says, "at which the committees arrived—the great principle which they asserted and demonstrated—was, that galvanic action, induced by the contact of zinc with the iron of the boiler, was the best and only trustworthy remedy for corrosion; and that, so long as the metallic contact was maintained, little or no corrosion would go on. They adopted a plan of hanging slabs or plates of zinc by iron straps from the slags or rods within the boiler, the zinc being held in a clip in which it was tightly bolted. The theory was perfect, but the weak point in practice was found to be in keeping up electric contact between the two metals. The committees endeavored to circumvent this difficulty—first, by fixing in each boiler an excessive number of plates, so that, apparently, if electric contact should cease even in many plates, it might chance to be maintained in some; and secondly, they directed a frequent examination with the view of renewing the contact and putting in fresh plates in lieu of those destroyed by corrosion. This system was the best they were able to arrive at, but it could only be maintained at such a cost that, to use the words of the report, 'the expense of the zinc necessary for efficient protection is undoubtedly an important element in determining how far it should be adopted.'" (It appears that the actual waste of zinc was much greater than that due to th protection of the boiler.) The author then describes a number of experiments, all of which failed from the same cause, namely, destruction of the metallic contact between the zinc and iron, from one cause or another. To remedy this, Mr. Hannay, an electrician of Glasgow, designed what he calls an "electrogen," composed as follows (we quote from Mr. King's paper): "A ball of zinc, with a copper conductor cast through the center of it, the copper being so combined and amalgamated with the zinc at the junction of the two metals as to form brass. Thus no corrosion could form between them to stop the galvanic current. The zinc is well hammered at a certain temperature, insuring long existence in an efficient condition. This ball is fitted in any convenient part of the boiler by a simple device, and a wire from each end of the copper is soldered firmly to the iron. From this moment the electrogen keeps up an uninterrupted galvanic current, and the whole of the interior of the boiler is absolutely protected from corrosion so long as any of the zinc remains. It was ascertained, by further experiments, that a very small surface of zinc was sufficient to afford protection for a radius of twenty-five feet from the point of contact, and the spherical form of the zinc was adopted because it would maintain perfect protection with a minimum of waste, the large surface exposed by plates, in proportion to their bulk, being quite unnecessary. Herein therefore, was the means of avoiding that waste which the Admiralty Committee stated 'was much greater than that due to the protection of the boiler,' and for which it sought a remedy. Two electrogens are found in practice sufficient to protect an ordinary 'single-ended' marine boiler, in which by some engineers, forty or fifty plates would have been considered necessary. The electrogens will last about six months, while the plates would probably corrode away in as many weeks. The zinc ball with its perfect contact, generates a current of greater intensity than zinc plates mechanically fitted, and the consequence is, that a portion of the water is slowly decomposed, and the hydrogen that is evolved at the negative pole, all over the surface of the iron and underneath the scale, forces off the scale in thin flakes by mechanical action as soon as it becomes thick enough to be impervious to the hydrogen. In this way, the scale is kept forming and reforming, hanging in loose flakes, or falling off as it becomes detached from the iron. Thus all the evils attending incrustation, which have been before enumerated, are avoided. Fuel is saved, burning of the iron prevented, and chipping becomes no longer necessary."

LABOR AND WAGES IN DUNDEE, (SCOTLAND.)

REPORT BY UNITED STATES CONSUL WELLS.

From careful inquiry it has been ascertained that the average wages of the working people in this town are for skilled artisans $6.87 per week of 54 hours' work, in the case of iron workers, and 51 hours for tradesmen connected with house building. Laborers get $4.75 per week for 57 hours. There are workmen that make more money weekly; for instance, iron shipbuilders, some of whom at piece work are paid from $11 to $15, and several others, such as boilermakers, who have about $8.50. The earnings stated, however, as the average are considered very near the mark. In the jute and linen works women in the spinning-mill departments make about $2.50, and in the weaving factories $3.50 of wages per week for 56 hours' labor. These working people on the whole are but poorly provided for in the way of house accommodation. There are in Dundee 8,620 houses of only one room each, in which there is a population of 23,670 and 16,187 houses of two rooms, into which are crowded 74,374 men, women and children. If to these be added the three-roomed houses with the people living in them, it shows that 118,000 of the 140,000 inhabitants of this community live in houses of one to three rooms. The rent per year of these houses, which are in flats, is, for a house of three rooms, including all taxes and convenience of water therein but not upholding gas, $77.50, and for one of two rooms $48. These houses are engaged for the year and rents are payable half-yearly. Rents for single-roomed houses are from 60 to 75 cents per week and payable weekly. As shown, a large portion of the population of this manufacturing center live in houses of one room and two rooms each, and especially upon these denizens the devastation of infectious diseases almost entirely falls, statistics proving that amongst them nine-tenths of the deaths from fever in this town take place.

Of the whole population this year 157 per 10,000 were attacked by infectious diseases, of whom rather more than 12 per 10,000 died. But among the population living in one and two rooms 183 persons per 10,000 were smitten, and rather more than 16 per 10,000 died, while among the whole of the rest of the population, including the people in the three-roomed houses, 101 per 10,000 were attacked, and only 4 per 10,000 died, showing clearly that the one and two-roomed houses are great nurseries of disease. Many of these single-roomed habitations are wretched in the extreme, containing little furniture, and occasionally are without even a bed. In some of these hovels five or six human beings are sheltered, with nothing to lie on but the floor, and covering themselves, when they have the opportunity, with jute burlaps, which they take in to make into hand-sewed bags. The sanitary authorities of this town do a great deal to cleanse and purify the entrances to, and vicinity of, these vile dens, so that they may be kept healthy, but without success, as they continually prove to be prolific sources of all sorts of contagion, which sometimes spreads with virulence throughout the whole community. There are here and there in Dundee large and well-constructed tenements erected in airy localities, in which working people can live with some degree of comfort. Such homes are, however, not so numerous as is desirable, and the general appearance of many of the dwellings is cheerless and squalid, with no bright surroundings, and wanting in ventilation and proper sanitary convenience. It is surprising, considering the way human beings are thus huddled together, without anything like an adequate supply of fresh air and often light, and in the midst of a polluted atmosphere, that these poor creatures continue so vigorous physically and cheerful as they are. This melancholy state of matters, it must be admitted, is not due altogether to the dire poverty of the people, but is, undoubtedly, in a great measure, the result of improvidence in spending much money for intoxicating liquors. It is stated that $1,500,000 worth of spirits and beer is annually consumed in this town, too much of which sum, it is said, is contributed by the toiling masses, who ought to be more careful of their scanty earnings. Apart from the incalculable amount of degradation, misery and vice, that intemperance entails on many of these poor people, they cannot afford thus to squander their hard-won money, but should rather devote it to procuring that which would render their homes more pleasant and habitable. Although habits which are not commendable characterize a portion of the working classes of Dundee, yet it is satisfactory to have to report that there is a large section of them prudent, economical and thrifty, and who manage to save money, as shown by the figures of the Dundee Savings Bank, chiefly resorted to by them. In 1882 this institution, the funds of which are guaranteed by Government, had 22,544 depositors, having at their credit $3,232,815. That year there was paid in $1,408,220, and paid out $1,259,820, showing a gain of $148,400. A few of these workingmen have sufficient means to purchase a house for themselves, instead of renting one, but this is seldom done. Scarcely any working tradesmen in Dundee possess homes of their own, on account of ground being so expensive within the town's boundary, and to build in the suburbs would be inconvenient, as being too far removed from the workshops. A pleasing feature to be mentioned is the large number of old, tried and faithful employés which are numerous amongst these working people.

Men, and women as well, who have been in the same employment for twenty or thirty years are not uncommon in Dundee. Sober, intelligent, reliable and decent servants are respected, esteemed, and their worth duly appreciated by employers here, who exert themselves to provide abundant and steady labor for such. Young people of both sexes can readily obtain employment in the jute and linen manufactories here. Dundee, therefore, attracts workingmen with families from surrounding small towns and rural districts. Boys and girls under fourteen years of age are engaged in these mills as half-timers, getting 60 cents per week for 28 hours work and education for two hours daily in the school connected with the mills. Those above that age are eligible for full-timers, and so can make the average wages already noted. Thus, the joint earnings of the family enable them to live pretty comfortably, and be well clothed. Indeed, it is noticeable that these respectable working people are nicely and warmly clad. Many of the factory girls overstep this medium and are expensively and fashionably dressed on Sundays or holidays. There are ample facilities for education and self-improvement in Dundee. Schools ably conducted are numerous and provided with everything appertaining to the imparting of instruction in all branches of knowledge. Still a large number of the rising generation are growing up in ignorance and crime through not attending these institutions for elementary learning. Parents are occasionally summoned before the sheriff's court and punished by fine or imprisonment for neglecting the education of their children. The invariable excuse of these delinquents is that they are so poor that they do not have the wherewithal to pay the 7 to 12 cents per week demand for teacher's fees, or are unable to furnish their children with clothes to properly appear in school. In some cases these pleas are too true, especially with widows or those in distress.

The school board try to alleviate these unfortunate people as far as possible by collecting clothes or money with the object of dressing the children. This, however, is only but a very partial remedy for the evil.

Free education, as in the United States, is what is required as a means of reaching the children of the whole mass of the population, so that every child may have a chance to be taught to read and write, and thereby be more likely to become worthy citizens and responsible members of the body politic. The inhabitants of Dundee have a free circulating and reference library and reading room, in which are upwards of 30,000 volumes. It is true that the kind of literature mostly read is of a light nature, such as novels, books on travel, magazines, etc. Works of a higher literary character and of a scientific and educative tendency, which abound in this collection, are, however, becoming yearly more sought after and taken out by the general readers, which is an evidence of a higher tone and taste prevailing. The wealthy in this community show praiseworthy public spirit and generosity in giving freely of their means for recreation parks, educational and general philanthropic purposes to benefit their less fortunate citizens. A rich lady still living has munificently gifted $650,000 to build and endow a university college in Dundee, which was opened a week or two ago with great *eclat*. Also, a gentleman, recently deceased, donated during his lifetime upwards of $250,000 for educational and benevolent schemes.

Clothing and Food Prices. The price here for a good, well-made, ordinary suit of tweed clothes usually worn by workmen when dressed, is $17. Coats can be bought for say $9; waist-coats, $3.50; trousers, $4.50; and strong boots for $4. The cost of the necessaries of life for fairly superior qualities is for a four pound loaf of wheaten bread 14 cents. In cents, the value of the pound of butter is 30, of sugar 7, tea 75, coffee 40, ham 24, oatmeal 3¼, American flour 4, European flour 3½; fresh beef, home fed, 24; American fresh beef, 16; mutton, home fed, 20; rice 4; cheese, American and European, 14; codfish, salted, 5; potatoes, 1; pork, salted, 12; American canned meat or beef, 19; milk, per pint, 4; and eggs, per dozen, 26. The food of the working classes is simple and homely, consisting of, it is understood, for breakfast porridge made with half a pound of oatmeal and supped with half a pint of milk, or tea, or coffee, and bread and butter, with perhaps either an egg, a bit of bacon, or a herring.

Dinner is frequently Scotch broth, cooked with cabbage, other vegetables, and beef; from 4 to 6 ounces of the latter is what falls to the share of the heads of a family. Supper, tea or coffee, with bread and butter, sometimes accompanied with a little delicacy. Mill and factory girls who do not reside at home but in lodgings or rooms are compelled to live more plainly, their wages being insufficient to pay rent, clothe themselves, and procure to the full extent the kind of fare specified. Animal food is therefore more rarely on their tables. Dressmakers, milliners, and shop girls make about as much money weekly as the workers in the factories, accordingly they have to be equally careful in the disbursement of their wages; nay, even more economical, as they must necessarily dress better than those employed in jute works. Domestic servants' wages are from $60 to $75 per annum, with board. They have less personal liberty than the women workers named, but housemaids and such like, when in respectable families, are more generously fed and cared for than factory girls, seamstresses or shopkeepers, especially when these do not live under the parental roof.

Trade has been on the whole prosperous in Dundee during the past year. Working people in all branches of industry have in consequence had, it may be said, plenty of labor. The iron ship building business has been exceptionally busy, and the men engaged in it have made large wages. The building trade has continued languid all through the year, but steady and competent masons, house-carpenters, etc., could generally find constant employment. In closing, no comparison is drawn between the condition of the working classes in the United States and this country, but the facts given are left to tell their own tale.

WILLARD B. WELLS, *Consul.*

FIRE HAZARD OF ELEVATORS.

Whether rightfully or not, grain elevators and warehouses have not been regarded with much favor by insurance companies. In this, as with many other classes of risks, the experiencing by insurance companies of heavy losses is largely due to their want of care in the selection of risks, and their vicious agency system which puts a premium on carelessness in accepting risks, since the agent has little or no care beyond securing his commission. Nevertheless, figures show that a good many elevators burn.

We have before us the New York *Chronicle's* Fire Tables for nine years, viz.: from 1875 to 1883, inclusive. From these tables we learn that in those nine years 341 elevators were burned in the United States, 78 of these fires occurring in 1883. In these same nine years 13 elevators were reported burned in the Dominion of Canada. There are reported in addition to the above the destruction of 3 floating elevators, all of which, we believe (though not stated), were at Baltimore. Of grain warehouses, 240 were reported burned in the United States in the nine years named, 39 being credited to 1883, while in Canada 35 were burned in the same period, 6 of which were credited to last year.

Figures like the above would seem to indicate that the fire hazard has been increasing; but the number of fires occurring in any class of risks is not always a fair measure of the fire hazard; for a class of buildings like elevators and grain warehouses may be increasing in number very rapidly. There were exactly as many tanneries burned in the nine years as elevators, and within three of as many breweries. There were twice as many *ice-houses* burned and more than twice as many churches, four times as many cotton gins, and five times as many flour mills. So elevators are not the worst risks, by a very large majority.—*American Elevator and Grain Trade.*

MEXICAN CORN BREAD.

So general and exclusive is the use of Indian corn in Mexico, that were this crop to fail one-third to one-half, the aboriginal population would die of starvation. A single frost on the 29th of August, 1874, injured the young plant, and it is calculated resulted in the death of over thirty thousand persons. A population of millions is dependent upon the success of the crop. Ireland is not so dependent upon the potato, and millions in India scarcely so dependent upon rice as the Mexican people are upon maize, now the foremost of our cereals. The monarch of our prairie lands and the arbiter of stock exchanges, it conceals from all who trace its ancestry, from even the most persistent botanist, every clew to its native valley and form of tropic progenitor.

Corn bread or *tortilla* is made from the grain in one establishment, the *tortilleria*, which is mill and bakery combined. Women kneel upon the floor of what resembles a blacksmith shop, the inclined rough surface of the lava *metate* before them. Upon this stone they place from a tray, handful after handful of corn which has been soaked and heated in water containing quicklime in solution. This alkaline substance has softened and loosened the exterior coating of the grain that in ordinary mills produces the bran. With a long, round stone held like a rolling-pin, this corn is rubbed to a coarse paste, which is pushed, as fast as it is deemed sufficiently crushed, upon a pine board placed below to receive it. This paste now goes to the cake maker, who stands near the fire. She takes a small piece and holding it in her hands vertically, pats it rapidly into a thin disc. This is thrown at once upon a hot earthen plate, where it is soon thoroughly baked or roasted.

WOMAN AND PROTECTION.

The direct results—or rather the inevitable results—of free trade are reduced wages. The fruits of cheap wages are poverty, social and moral degradation and crime. When the workingman's pay is reduced below a certain point he is no longer enabled to support his family by his own exertions, but is compelled to call upon his wife and children to aid him in his task. In free-trade countries where wages are lowered below that point, the families are often compelled to engage in the most menial employments, and the women in frequent instances are forced into an unnatural competition with men in the kinds of employment suited only to the latter. This is the boon which free trade brings to the poor man. Cheap goods may be desirable, but who would ask for them at the cost of human happiness? Who would seek for them, knowing that they were made cheap by the toil and labor of women and children? Who would ask for cheap goods—the kind of cheap goods which the free-trader longs for—when it is known that to produce them the wife must be dragged from her home to slave in the shop, and that childhood must be robbed of its freedom and joys? Free trade is founded on the wrecks of domestic peace and happiness, on the loss of virtue and honor, on the loss of health and happiness of fathers, mothers and children, on the loss of everything dear to man or woman. It is the enemy of the home, a foe to virtue, a menace to the peace and stability of society. A doctrine that plants its foot upon the heart of womanhood, and that brings desolation to her home, that tears her from her children and forces her to labor like a slave, is most foul and pernicious, and no wonder it is spurned by nearly every civilized country on the globe.—*Industrial World, (Chicago).*

MONTERICHARD'S PROCESS FOR MAKING BREAD.

(Translated for the United States Miller.)

The inventor of this new system of bread-making claims that it will insure about 10 per cent. more bread, than the usual method, that is, 100 pounds of flour, made into bread by the new process, will produce ten pounds more bread than if the usual method had been employed.

Taking into consideration the enormous amount of bread which is daily being produced and consumed, it is evident that this process, which is by no means expensive, and requires no chemical manipulation, possesses great advantages over the old. Aside from this gain in quantity, it is said that the bread possesses hygienic and digestive qualities not to be found in the bread at present in use. Various attempts have from time to time been made to produce such a result, principally consisting in cooking grain or bran in water until it is entirely broken up, and then subjecting the mass to a strong pressure, so as to separate all the liquid part. This fluid is then mixed with the water used for kneading. This water containing gluten is, however, distributed unequally through the dough, and evaporates entirely during the baking, leaving the gluten in parts of the bread, the weight of which is increased, but its quality and food value diminished.

The method in question, on the other hand, assimilates the water remaining in the dough, producing combinations which increase the value as food. The results of the two processes are, consequently, entirely different; in the former case consisting of an increase of weight, in the latter increased production of bread.

The new process does not change the usual operations of preparing the dough from the flour, and the kneading and baking also remain the same. The difference consists entirely in employing for mixing a water in which a proper amount of grain has been boiled.

Although any kind or quantity of grain can be used, the following formula has been found to answer the purpose best: Put 100 lbs. of cold water in a kettle and immerse therein a basket made of wire, containing one quart of grain (wheat is the best), piled loosely, so that it is entirely covered by the water. Then boil the grain for about one hour, when the basket is removed.

The water thus obtained is cooled to the requisite degree and must be used for all the operations of baking, in the same quantity as usual; but it is of great importance not to mix it with any unprepared water. It is, further, necessary to stir it well before using it, particularly if it has been prepared for some time.

No matter what the quality of the flour, the water prepared in this manner facilitates the separation of the sugar and dextrine, while it imparts more body to the gluten and the starch, which explains the increased amount of bread obtained by this new process.—*Allgemeine Muehlen-und Maschinen-Industrie-Zeitung.*

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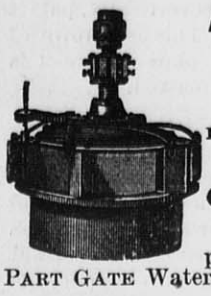

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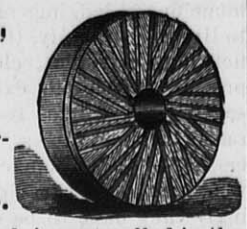

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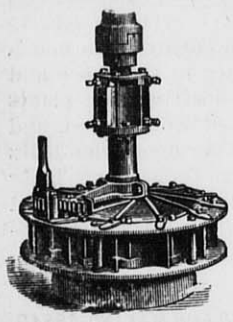

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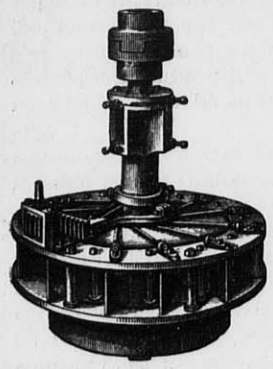

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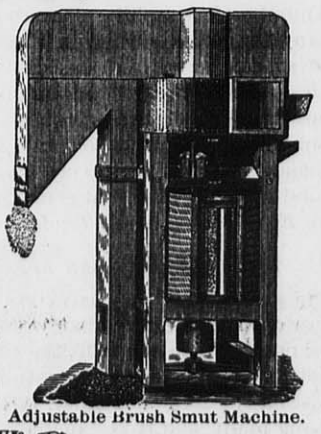

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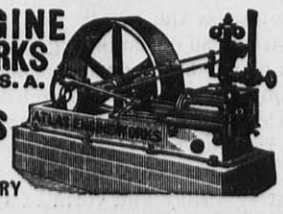

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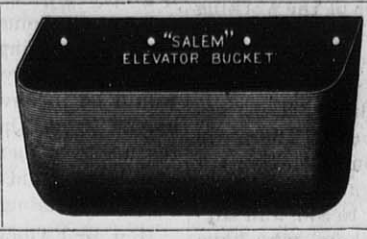

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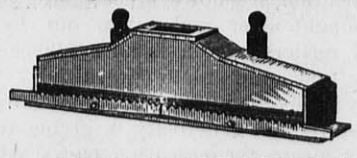

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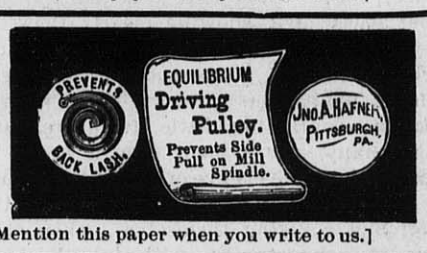

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DIMENSIONS OF MILL BUILDINGS.

For the convenience of millwrights and parties desiring to build new mills, the following table of dimensions of buildings suitable for mills of various capacities from 50 to 500 barrels daily, has been prepared. The figures are taken from actual practice, and may be relied upon as being correct. It will be noticed that several different sizes are given for mills of each capacity, so that the one most suitable for the proposed location may be selected.

Capacity.	Outside dimension	Dis. from center to center of posts. Length-wise.	Cross-wise.	No. posts on each floor.	Height of stories from floor to top of floor above (attic from floor to under side of rafters at lowest point.) Basement.	First story.	Second story.	Third story	Fourth story.	Attic	Wheat Storage, Bush.	REMARKS.
75	30 x 40'	14	.....	2	10'	11'	14 6'	.....	....	11'	Small	
100	42 x 45	14'	14'	4	10'	11'	14'	.....	.....	14	6,000	
100	35 x 55'	14'	12	6	10'	12	14'	.....	.....	16	4,000	No spare room.
*150	45 x 50	12'	14' 6	6	10'	12'	14'	.....	.....	15'	4,000	Ample room.
150	35 x 65'	13	12	8	11'	12'	14'	.....	.....	16'	4,000	No spare room.
200	45 x 60	12'	14'	8	12	12	10'	14'	.....	16'	9,000	Ample room. With bin floor.
200	45 x 50	12	14'	6	11'	12'	15'	.....	.....	16	Small	No spare room. No bin floor.
200	35 x 80	13'	12	10	11'	13'	16'	.....	.....	16'	5,000	No spare room. No bin floor.
250	50' x 60	12'	12'	12	12'	12'	10'	13'	13'	12'	20,000	Ample room. With bin floor.
250	45 x 55	13' 6"	14' 6'	6	11'	12'	14'	13'	.....	12'	8,000	No spare room. No bin floor.
250	38' x 80	13'	12'	10	12'	12'	14'	14'	.....	14'	6,000	No spare room. No bin floor.
300	50 x 65	12 6'	12'	12	12'	12'	10'	13'	13	14'	10,000	Ample room. With bin floor.
300	45' x 60'	12'	14' 6'	8	12'	13'	14'	13'	.....	13'	5,000	No spare room. No bin floor.
300	38' x 90	12 6"	12 6"	12	12'	13'	14'	13'	.....	15'	10,000	Ample room. No bin floor.
500	58 x 80'	13'	14'	15	14'	14'	12'	15'	14'	16'	20,000	Ample room. With bin floor.
†500	48' x 70'	14'	12'	12	14'	14'	15'	14'	.....	15'	Small	No bin floor.
500	40' x100'	14'	13'	12	14'	14'	13'	14'	.....	16'	8,000	Ample room. No bin floor.

*This mill can also be put in a building 42x50—same storage.
†Smallest building that this mill can be put in to advantage; no bin floor.

Beams are to run crosswise of building, joists lengthwise. Joists on all floors to be 3x12, 16 inches from center to center. Corresponding joists in each floor should be plumb above those in floor below.

Single floors in all stories except grinding floor and basement; the former to have a double floor and the basement a cement floor 4 inches thick.

Roofs flat, tar and gravel, pitched narrowest way of building; pitch ½ inch to the foot. Rafters 2x6, 16 inches from center to center.

Size of posts in basement, 12x12; attic, 8x8; beams under grinding floor, 12x12.—*From the "Millwright and Engineer."*

THINGS WORTH KNOWING.

VIENNESE bread is celebrated. It may interest you to know something about it. The excellence of the bread is attributed in Vienna to three reasons—the oven, the men and the yeast. I think another may be added, and that is the dry climate. An ounce of yeast (three decagrammes) and as much salt is taken for every gallon (one litre) of milk used for the dough. The yeast is a Viennese specialty, known as "St. Marxner Presshefe," and its composition is a secret. It keeps two days in summer and a little longer in winter. The ovens are heated by wood fires lit inside them during four hours; the ashes are then raked out and the oven is carefully wiped with wisps of damp straw. On the vapor thus generated, as well as that produced by the baking of the dough, lies the whole art of the browning and the success of the "semmel."

LONDON has altogether ninety-seven public breweries, consuming 8,865,740 bushels of malt and corn and 31,937,772 lbs. of sugar. The Litchfield collection, which includes the Burton district, comes next, with forty-eight breweries, consuming 6,229,209 bushels of malt and corn and 4,325,652 lbs. of sugar. Dublin is next on the list, with ten breweries, using 3,093,651 bushels of malt and corn and 362,606 lbs. of sugar. The other largest brewing centres are Manchester, Edinburgh, Sheffield and Warrington, all of which consume upwards of 1,000,000 bushels of malt and corn.

SAVE GROUND FOR BUCKWHEAT.—There is no crop that pays the farmer better in the West, than a patch of buckwheat. Most of the flour used in our Western cities made from buckwheat, is imported from the Middle and Eastern States. This is a needless expense. The money paid out for it should be kept at home, and it could be if the farmers would only sow that variety of grain. There is no part of the continent that produces better crops of buckwheat than the Northwest. It can be sowed, harvested and threshed without interfering with any other work on the farm. After all the other spring work is finished it can be sowed. After all the wheat, oats, barley and rye crops are harvested, the buckwheat crop can be harvested. After all the other grain crops are threshed the buckwheat can be threshed. So it won't interfere with the bustle and hurry of the farm at all. It has a season by itself and at a period when farmers have little else to do on the farm. We hold that it is the duty of Western farmers to produce anything incident to the soil and climate, that can be profitably raised, especially crops that have as much money in them as there is in buckwheat.

COTTON SEED HULLS.—It looks like a small matter, but the annual cost of cotton waste in packing journal boxes amounts to a very large sum. It may not be known to railroad officials, but the use of cotton seed hulls for this purpose is making much progress, and while equally as satisfactory in efficiency is far less expensive. The cotton-seed oil mill is located near the depot, and it would be worth the while for them to experiment with it, if nothing more. We see a statement made and that, too, from a most reliable source, that a leading trunk line has purchased over 100,000 pounds of hulls from the National Railway Patent Waste Company within a few months. The economical results of the use of this packing have been clearly demonstrated. A recent careful test gave the following:

1. An account having been kept of the cost of packing the boxes on one side of a car with cotton waste and oil, the boxes on the other side of the car with hulls and oil for the same length of time, showed that

The cost of cotton waste and oil was	$4 17
The cost of cotton-seed hulls and oil was	2 66
A saving in favor of hulls and oil of	$1 51

2. An account having been kept of the cost of packing one side of an engine with cotton waste and oil, and of packing the boxes on the other side of the engine with hulls and oil, for the same length of time, showed that

The cost of cotton waste and oil was	$4 08
The cost of cotton-seed hulls and oil was	1 70
A saving in favor of hulls and oil of	$2 38

The above saving is not only in cost of hulls as compared with waste, but also in the amount of oil used, hulls requiring much less oil than waste.

STARCH.—The principal grain from which starch is manufactured at the present time is Indian corn—wheat and potatoes being used in limited quantities.

There are twenty-four factories in the United States manufacturing starch from corn. Fifteen of these are working under the new method or chemical process, and producing about two-thirds of the total amount made per annum. The balance work by the old method, or fermentation process.

Indiana is the leading State of the Union in the production of starch from corn, having eight factories and producing more than one-third of the total amount made.

The total capacity of the mills manufacturing starch from corn is a trifle over 200,000,000 pounds per annum. The total number of pounds of starch of all kinds exported from the United States in the twelve months ending July 1st, 1883, was 7,033,715.

The consumption of starch for all purposes in the United States is about 150,000,000 pounds per annum, or an average of three pounds for each person.

DRILLING AND FILING GLASS.—Glass may be readily drilled by using a steel drill hardened but not drawn at all, wet with spirits of turpentine. Run the drill fast and feed light. Grind the drill with a long point and plenty of clearance, and no difficulty will be experienced. The operation will be more speedy if the turpentine be saturated with camphor gum. With a hard tool, thus lubricated, glass can be drilled with small holes, say up to three-sixteenths, about as rapidly as cast steel. A breast or row drill may be used, care being taken to hold the stock steady, so as not to break the drill.

To file glass, take a twelve-inch mill file, single-cut, and wet it with the above solution—turpentine saturated with camphor—and the work can be shaped as easily and almost as fast as if the material were brass.

To turn in a lathe, put a file in the tool stock and wet with turpentine and camphor as before. To square up glass tubes, put them on a hard-wood mandrel, made by driving iron rod with centers through a block of cherry, chestnut, or soft maple, and use the flat of a single-cut file in the tool post, wet as before. Run slow. Large holes may be rapidly cut by a tube-shaped steel tool cut like a file on the angular surface, or with fine teeth, after the manner of a rose bit; great care being necessary, of course, to back up the glass fairly with lead plates or otherwise, to prevent breakage from unequal pressure. This tool does not require an extremely fast motion. Lubricated as before, neat jobs of boring and fitting glass may be made by these simple means. The whole secret is in good high steel worked low, tempered high, and wet with turpentine standing on camphor.—*Scientific American.*

A GOOD LUBRICATOR.—Castor oil is a good lubricator for machinery by reason of its great adhesiveness and elasticity. On this account it is also comparatively cheap; cheaper in fact, than many of the lubricators, axle greases, etc., offered for sale, which are often, for the sake of increased weight and volume, adulterated with worthless and even deleterious substances.

AN AUSTRIAN VIEW OF THE WHEAT FIELDS OF THE WORLD.—The Mississippi Valley is now the most extensive wheat field of the world, and the produce it yields is not only consumed by a large portion of the population of the United States, but quantities are also sent to Europe. California has already reached the highest point of its producing capacity, and must at an early date be expected to yield less, in consequence of perpetual cultivation having exhausted the land. In addition to this, wages in California are quite as high as in the Mississippi Valley, whilst the former place is more than 3000 miles distant from the home and foreign markets, even if the most direct railway route be used—that *via.* Festland, which is likewise the dearest. By water the difference in the distance is more than 1,000 miles. The wheat fields of Russia are too far away to have the advantage of cheap means of transport. Nevertheless, they constitute a formidable competition to the Mississippi district on the European market. Russia cannot meet all requirements; therefore, with a good harvest and normal rates of transport, the English market is assured to the Mississippi Valley. India, by virtue of her extent and the richness of her soil, is capable of meeting the extra demand of every country in Europe; but agriculture in that country is still in a very primitive state, and labor is so very cheap that no mechanical appliances are used there. America has a great superiority in this respect, as by the aid of her machinery she can not only work cheaper than India, but is also nearer to the European markets, India being 6,000 miles, whereas America is only 4,000 miles distant from Liverpool. The freight from these countries stands in the proportion of 9 to 15. India also labors under the further disadvantage that when her corn is brought to Europe it is subjected to a longer sea voyage, which affects it unfavorably. Furthermore, the population of the United States is growing more rapidly than the harvests, and it is computed that in twenty-two years there will be no surplus, but an additional requirement of 100,000,000 bushels.—*Oesterreichische Ungarische Mueller Zeitung.*

NEWS.

The North Star Iron Works of Minneapolis are doing a very prosperous business.

A new belt drive for roller mills is being introduced in the Anchor Mills at Minneapolis.

Lawson & Bell, millers at Gallipolis, O., have failed. Liabilities reported at $25,000; assets $20,000.

BURNED—Dewey & Williams grist-mill at Waterford, Pa., March 25th. Partially insured.

Wike & Perry, Barry, Ill., have lately started up their mill on the Case system with satisfactory result.

The Case Mfg. Co., Columbus, O., have an additional order for four pair rolls, J. M. & H. C. Allen, Grafton, Ill.

The Case Mfg. Co., Columbus, O., have an order from Riley, Brookville, Ohio, for breaks, rolls, purifiers, etc.

J. H. Townshend & Co's two mills at Stillwater, Minn., are running to full capacity turning out 650 barrels of flour per day.

Wilford & Northway of Minneapolis have taken the contract to build a 100 barrel roller mill for Irav Pederson at Eltrick, Wis.

Messrs. Wike & Perry of Barry, Ill., have changed their mill over from the stone system to the case gradual reduction system.

James Veatch & Son are remodeling their mill at Redmond, Ill., with machinery from Nordyke & Marmon Co., of Indianapolis, Ind.

The Case Mfg. Co., Columbus, O., have an order from E. J. Sourwine, Republic, Ohio, for two pair rolls with patent automatic.

Logan Bros. & Co., Shaklyville, Pa., have ordered one pair rolls with patent automatic feed from the Case Mfg. Co., Columbus, O.

A three-run new process mill is being built at Dublin, Tex., using machinery made by Nordyke & Marmon Co., of Indianapolis, Ind.

BURNED—April 22, the stone flour mills at Wilson, Ks., with 2,000 bushels of grain. Cause unknown. Loss $30,000. Insurance $12,000.

Hardesty Bros., Columbus, O., have ordered a patent automatic feed from the Case Mfg. Co. to be placed on their 'Downton" rolls.

The Case Mfg. Co., Columbus, Ohio, have an order from the Edgerton Mill Co., Edgerton, Kans., for breaks, rolls and centrifugal reels.

A boiler in Bathrick's mill at Davison Station, exploded on the 17th, killing the engineer and fatally injuring the son of the proprietor.

Thos. Robinson & Son (Limited), Rockdale, England, have ordered twelve additional sets of rolls from the Case Mfg. Co., Columbus, Ohio.

Bowen Bros. are having a three-run steam mill outfit made for them by Nordyke & Marmon Co., which will be set up at Maysville, Ind.

Hardesty Bros., Columbus, Ohio, have ordered from the Case Mfg. Co. a four roller "Bismarck" frame placing in it their Stout mills and Temple rolls.

The Case Mfg. Co., Columbus, Ohio have an order from Mitchell & Scruggs, Dallas, Tex., for a No. 1 double purifier, to be shipped to Terrell, Tex.

Lessig & Co., of Ashland, Penn., are building an 80-barrel roller mill, and Nordyke & Marmon Co., of Indianapolis, Ind., are making all the necessary machinery.

Basher, Hepner & Leedy, of Longmont, Colo., have ordered a large amount of machinery of Nordyke & Marmon Co., of Indianapolis, Ind., for improving their mill.

McAnnally, Raney & Co., of Sipe Springs, Tex., are building a two-run custom mill and procured their machinery from Nordyke & Marmon Co., of Indianapolis, Ind.

J. L. Bihn of Tiffin, O., is building a one-run custom mill driven by steam, and has selected his machinery from Nordyke & Marmon's mill building establishment at Indianapolis, Ind.

A Western agent of the Case Mfg. Co., Columbus, Ohio, recently sold thirty-six pairs of rolls in one week, besides selling other machinery of their manufacture in proportion.

The Case Mfg. Co., Columbus, Ohio, have an order from the Darling Mill Co., Freemont, Mich., for 1 No. 1 double and 1 No. 1 single purifier, 1 bolting chest and other machinery.

The Case Mfg. Co., Columbus, Ohio, have an order from E. S. McChatic, Rossville, Kans., for one "Little Giant" break machine and scalper combined making three separations.

The Case Mfg. Co., Columbus, Ohio, have lately remodeled the mill of D. B. Stewart, Athens, Ohio, to the gradual reduction system. The mill has lately started up with good results.

The Case Mfg. Co., Columbus, Ohio, have lately received an order from the Victor Mill Co., Shelbyville, Tenn., for eight pairs of rolls with patent automatic feed and 1 No. 1 double purifier.

A 75-barrel roller mill is being built near Gibbon, Neb., for J. N. Davis & Bro., old millers in that locality. Their entire contract is placed with Nordyke & Marmon Co., of Indianapolis, Ind.

The flouring mill of W. C. Hall, at Brazil, Ind., is being changed to the roller system, using rolls and other machinery made especially for him by Nordyke & Marmon Co., of Indianapolis, Ind.

The mill of W. S. Hall, of Steele City, Neb., and W. H. Patterson, of Smithville, Mo., are undergoing extensive repairs with machinery from Nordyke & Marmon's shops at Indianapolis, Ind.

The Case Mfg. Co., Columbus, Ohio, have an order P. H. McHale, St. Marys, Kans., for one "Little Giant" break machine and scalper, making three separations and one No. 1 single purifier.

The Case Mfg. Co., Columbus, O., have lately received an order from Adam Simpson, Owatona, Minn., for 7 pairs of rolls and one three roll break machine all to have their patent automatic feed.

A Detroit company claims to have hauled the greatest weight ever moved on wheels in the United States. It was a boiler weighing 35 tons, designed for a steam barge, and it took 16 heavy draught horses to pull it.

The Brownwood Mill Co. of Brownwood, Tex., have organized to build a 200-barrel roller steam mill, and the machinery for the entire outfit is being shipped from Nordyke & Marmon Co.'s mill works at Indianapolis, Ind.

McDowell & Basye, of Simpsonville, Ky., are replacing their burned mill with a first-class roller mill of 100 barrels capacity, and their rolls and other machinery are being made by Nordyke & Marmon Co., of Indianapolis, Ind.

The mills of Haworth, Smock & Co, Dill & Son, and Evans & Sohl, all of Noblesville, Ind., are being remodeled to the system of gradual reduction and the machinery comes from Nordyke & Marmon Co.'s works, at Indianapolis, Ind.

The Case Mfg. Co., Columbus, O., have lately taken the contract of the Peckler Milling Co., St. Jacobs, Ill., for a full line of breaks, rolls, purifiers, centrifugals, scalpers, etc., for a complete gradual reduction mill on the Case system.

Curry & Glover are building a 75-barrel mill at Aurora, Neb., and Nordyke & Marmon Co., of Indianapolis, are furnishing their machinery. Fr. Hagenmeister, of the same town, has also ordered a three-run mill of the same firm.

E. M. Britts, Verndale, Minn., has concluded to remodel his mill to the roller system and after carefully investigating the different systems has placed his order with the Case Mfg. Co. for a full line of breaks, rolls, purifiers, centrifugals, scalpers, etc., for a complete gradual reduction mill on the Case system.

Mr. Gillet, manager of the *Societe de Construction de Passy-Paris*, 14 rue du Ranelagh the agent of Ganz roller-mills in France has since the recent experiments in milling by the Paris Syndicate received orders for remodeling the mills owned by Mr. Dubray, Mr. Cadet, Joset frères, Lallemand Wannant, Peugeat and Benoit freres.

J. C. Haust, miller for Ino Bidwell of Chico, Cal., in a recent letter to the Case Mfg. Co. says: "We have been running the Little Giant Break machine scalper nearly two years making the first break for 150 bbls. flour per day (twenty-four hours) and it has not cost us five cents for repairs, and I don't believe there is any other machine that makes a better break."

The following millers have lately sent in their orders to the Eureka Mfg. Co. of Rock Falls, Ills., for Becker wheat brushes: Russell & Bailey, Wetmore, Kans.; Whistler & Harbarger, Mackinaw, Ills.; Wilson Davis, Galesville, Wis.; N. Belymer & Son, Fairfield, Ills.; L. D. Short & Co., Kerndon, Mo.; O. Wetsch, Elmore, Ohio; Goodale & Co, Delhi, Mich.; Loudenslager & Bœrner, Loudensville, W. V.; T. H. Coley, Eldora, Ills.; Rolla Mill Co., Rolla, Mo.

"It is the open secrets," says Carlyle, "that the major portion fail to read. It is the obvious truths they continually overlook, always looking into the distance for the succor which lies in their own immediate surroundings, to others, for the help lodged in their own capacity. To those richer, stronger or wiser for the power abiding in their own strong hands, to the wide world for the opportunities hidden in their own neighborhood. We cannot learn too soon nor too well, that in ourselves is lodged whatever force is needed to send us along the path of a successful life; that close to us is the work which our hands are to do, and that right before our feet lies the path in which we are to walk."

Minto, Dak., is to have a new 125-barrel roller mill.

The citizens of Westbourne, Man., offer a bonus for a grist mill.

Webster, Dak., wants a mill; also a machine shop and foundry.

There is a fine opening for a 50-barrel roller mill at Gladstone, Man.

A flouring mill is wanted at Andover, Dak., says an exchange; the country will support it.

Wm. Annesser, of Ottawa, O., intends building a large three-story brick mill this spring.

J. F. Crowl, a mill owner of Montpelier, O., will build a 75-barrel roller mill at Reading, Mich.

Brandon, Minn., has subscribed $500 toward procuring a grist and saw mill combined at that place.

The mill of Kline, McDonald & Hall, at Horseheads, N. Y., burned recently. Loss $20,000; partly insured.

The Case Mfg. Co., Columbus, O., have just shipped Geo. L. Hays, Piketon, Ohio, two additional pair of rolls.

Busby & Sons, Lebanon, Indiana, have lately started up their mill on the Case gradual reduction system.

The Case Mfg. Co., Columbus, O., have an order from Jacob Rohm, Mansfield, Ind., for breaks, rolls, scalpers, etc.

The Case Mfg. Co., Columbus, O., have an additional order from Park & Bison, Sidney, Ill., for one centrifugal reel.

The Case Mfg. Co., Columbus, O., have an order from P. M. Weist, Peney Creek, Md., for breaks, rolls, purifiers, etc.

Morenci, Mich., wants a roller mill and offers $3,000 to any person who will construct a mill of that description in that village.

The Case Mfg. Co., Columbus, O., have an order from Jonathan Gregson, Austin, Minn., for one additional pair of rolls.

The Case Mfg. Co., Columbus, O., have an order from Thos. H. Mosier, Springville, Mich., for one additional pair of rolls.

The Case Mfg. Co., Columbus, Ohio, have lately shipped an additional No. 1 double purifier to G. C. Gœting, Altamont, Ill.

Shaner, Knott & Co., Beaver Falls, Pa., are putting in an additional pair of rolls furnished by the Case Mfg. Co., Columbus, Ohio.

The Case Mfg. Co., Columbus, Ohio, have an additional order from Chas. Semmern, Belmont, Wis., for one centrifugal reel.

The Case Mfg. Co., Columbus, O., have lately shipped A. H. Fairchild & Son, North Bloomfield, N. Y., one No. 1 double purifier.

The Case Mfg. Co., Columbus, O., have an order from C. Master, East Liverpool, O., for two pair rolls, with patent automatic feed.

D. F. Robinson, Georgetown, D. C., has ordered a patent automatic feed for his "Allis" rolls from the Case Mfg. Co., Columbus, O.

The Case Mfg. Co., Columbus, O., have an order from G. D. Baker, Montrose, Mo., for one patent automatic feed box for his purifier.

The Case Mfg. Co., Columbus, Ohio, have an order from G. W. Brown, Roseville, Ohio, for two pair rolls with patent automatic feed.

The Case Mfg. Co., Columbus, O., have an order from Klingerhoffer & Sigg, Florida, Ohio, for two pair rolls with patent automatic feed.

R. P. Moore, Talona, Ill., has placed his order with the Case Mfg. Co., Columbus, Ohio, for two pair rolls with patent automatic feed.

The Case Mfg. Co., Columbus, O., have an order from Slitt and Middlekamp, South Pueblo, Col., for breaks, rolls, purifiers, scalpers, etc.

The flouring mills of Rambo, Bros. at Dresden, O., were destroyed by fire on the 5th inst. Loss, $50,000; insurance $35,000, in several companies.

The W. P. Huffinan Implement Co., Fort Worth, Tex., have ordered two pair rolls with patent automatic feed from the Case Mfg. Co., Columbus, Ohio.

Hanna, Mouldin & Co., are having built for them at Oakland, Ind., an 80-barrel roller mill using Nordyke & Marmon's machinery made at Indianapolis, Ind.

The Case Mfg. Co., Columbus, O., have an order from D. F. Robinson, Georgetown, D. C., for two patent automatic feed boxes for his Smith purifiers.

The Case Mfg. Co., Columbus, Ohio, have the order of Adam Simpson, Owatonna, Minn., for one three roll break machine and 5 pair of rolls with patent automatic feed.

The Case Mfg. Co., Columbus, Ohio, are furnishing H. T. Holiday, Rapidan, Va., with 4 pair rolls with patent automatic feed, centrifugal reels and other machinery.

The Case Mfg. Co., Columbus, O., have an order from the Richmond City Mill Works, Richmond, Ind., for two pair rolls to be shipped to G. W. Gray, North Freedom, Wis.

The Case Mfg. Co., Columbus, O., have lately shipped the Great Western Mfg. Co., Leavenworth, Kans., one "Little Giant" break machine and scalper making three separations.

The Case Mfg. Co., Columbus, O., have an order from Kerfoot Bros., Des Moines, Iowa, for one "Little Giant" machine and four pair rolls with patent automatic feed.

Robt. Christian is building a two-run water mill at New Canton, Tenn., using machinery made by Nordyke & Marmon Co., of Indianapolis, which is being set up by Mr. John R. Creasy.

Jacob Wiessmann, Clintonville, Ohio, is making some changes in his mill, putting in two pair rolls with patent automatic feed, furnished by the Case Mfg. Co., Columbus, O.

The Beall Engine, Boiler and Machine Works at Cumberland, Md., report business good. They are meeting with a good demand for their new *Keystone* roller mill, recently introduced.

The Case Mfg. Co., Columbus, O., have an order from Peter Miller, Sparta, Wis., for one double three roll break machine, four pair rolls with patent automatic feed, centrifugal reels, etc.

Oelze Bros., of Cloverport, Ky., are among the latest to adopt the roller system, their contract for a complete overhauling having been awarded to Nordyke & Marmon Co., of Indianapolis, Ind.

The Northwestern Milling Co., of Milwaukee, Wis., have filed articles of incorporation. The incorporators are Frederick Kuecker, William Kuecker, and Thomas Abrighton. Capital stock $7,500.

Carter & Emmons, of Celino, Tenn., who met with the loss of a fine flouring mill last fall, have contracted with Nordyke & Marmon Co., of Indianapolis, Ind., for a 75-barrel roller mill outfit of improved style.

The Case Mfg. Co., Columbus, Ohio, have an order from A. F. Ordway & Son, Beaver Dam, Wis., for one three roll break machine and six pair of rolls to be placed in the mill of Fred. Dehne & Bros., Hustisford, Wis.

Capt. F. M. Drake, Waldo, O., writes the Case Mfg. Co., Columbus, Ohio: "The automatic feed I bought of you for my 'Odell' rolls is at work and doing No. 1. I think it is the finest thing for feeding middlings I ever saw."

The Case Mfg. Co., Columbus, Ohio, have lately taken the contract of S. M. Winger & Bro., Lincoln, Mo., for a full line of breaks, rolls, purifiers, centrifugals, etc., for a complete gradual reduction mill on the Case system.

The Case Mfg. Co., Columbus, Ohio, have lately been awarded the contract of W. W. Bristol, Girard, Ill., for a full outfit of breaks, rolls, purifiers, centrifugals, etc., for a complete gradual reduction mill on the Case system.

The Case Mfg. Co., Columbus, O., have been awarded the contract of G. C. Harvey, Canton, Ohio, for a full line of breaks, rolls, purifiers, centrifugals, scalpers, etc., for a complete gradual reduction mill on the Case system.

The Case Mfg. Co., Columbus, Ohio, have been awarded the contract of Moote & Murphey, Oak Grove, Mo., for a complete outfit of breaks, rolls, purifiers, scalpers, etc., for a gradual reduction mill on the "Case" system

The Case Mfg. Co., Columbus, O., have been awarded the contract of Peter Gillespie, Northville, Mich., for a complete outfit of breaks, rolls, purifiers, centrifugals, scalpers, etc., for a full gradual reduction mill on the "Case" system.

The Case Mfg. Co., Columbus, O., have been awarded the contract of the Peckler Milling Co., St. Jacobs, Ill., for a full line of breaks, rolls, purifiers, centrifugals, scalpers, etc., for a complete gradual reduction mill on the "Case" system,

The prominent mill-builders, Nordyke & Marmon Co., of Indianapolis, Ind., have just completed a 100-barrel mill, at St. Paul, Neb., for H. C. Metcalf, and have commenced upon a similar mill on the roller system for Crow & Leftwich of the same town.

J. T. Brimfield, Harden, Mo., after carefully investigating the different systems of gradual reduction has placed his order with the Case Mfg. Co., Columbus, Ohio, for a full outfit of breaks, rolls, purifiers, centrifugals, scalpers etc., for a full roller mill.

Mr. J. F. Littrell of the Geo. T. Smith Purifier Co., furnished the plans for Ardinger & Cress' new mill at Greenfield, Ill. This mill will be an exclusive centrifugal mill, not a single bolting chest being used. Five centrifugals and four purifiers will do the work.

The Case Mfg. Co., Columbus, Ohio, have been awarded the contract of D. L. Crossman, Williamstown, Mich., for a full gradual reduction mill on the Case system using nine pair of rolls in connection with their breaks, purifiers, scalpers, centrifugals, etc.

The Case Mfg. Co., Columbus, O., have been awarded the contract of E. K. Stratton, Greensboro, Ind., for a complete outfit for a full gradual reduction mill on the Case system, using ten pair of rolls in connection with their breaks, purifiers, scalpers, centrifugals, etc.

John Almquist, a miller employed in the Goodhue Mill at Cannon Falls, Minn., on the 14th inst, was caught in the gearing of a set of rolls and his left arm crushed in a fearful manner. He was extricated with great difficulty. It is miraculous that he was not instantly killed.

The Case Mfg. Co., Columbus, Ohio, report that they are crowded to their utmost capacity with orders for their specialties and have been compelled to erect a large addition to their factory which will increase their capacity almost one-third. This will enable them to fill orders more promptly. They report the outlook for a large trade this season as very flattering. Their order book shows an increase of orders for March, of almost 50 per cent. over the corresponding month of last year.

The boiler in the grist mill of D. P. Bathbrick, Davidson Station, Mich., exploded April 18th, fatally injuring the engineer, John Miller. The miller, John Bathbrick, was slightly injured about the head. Will Hall was hurt about the face and arms. Another man was hurt about the head. The mill was wrecked.

The O. K. flouring mill at Litchfield, Ill., was destroyed by fire on the 15th inst. The two upper stories were wrecked by the flames before they could be extinguished by the fire department. The building, machinery and contents were valued at $18,000 on which there is an insurance of $9,500. The mill had been standing idle for some days, and the cause of the fire is a mystery.

Orders received by Messrs. Allis & Co. during the past month:

W. H. C. Kemp, Williamsport, Ind., a Gray's noiseless belt roller mill.

Frank Newman, Dorr Center, Mich., a Gray's noiseless belt roller mill.

Work on the new mill of Eckhart & Swan, at Chicago, is progressing favorably and the mill will soon be finished.

From Messrs. Johnson & Jarrett, Des Moines, Iowa, a Gray's noiseless belt roller mill for Messrs. Setzer & Conard, Kellogg, Iowa.

From Messrs. Bass' Foundry and Machine Works, Fort Wayne, Ind., a Gray's noiseless belt roller mill for J. E. Young, Alexandria, Ind.

From Bradford Mill Co., Cincinnati, Ohio, twelve pairs Allis rolls in Gray's noiseless belt frames for a job they have under construction.

Clay County Milling Co., of Liberty, Mo., have placed contracts with Messrs. Allis & Co., for a complete roller plant for their mill, and will use ten pair of the celebrated Allis rolls in Gray's noiseless belt frames.

Eagle Mill Co., McPherson, Kas., have contracted with Messrs. Allis & Co., for a No. 2 four-break reduction machine, six pair Allis rolls in Gray's noiseless belt frames, 12x30 Reynolds' Corliss engine; in fact, a complete outfit for a new mill.

From Messrs. Richards & Butler, Indianapolis: Four pairs Allis rolls in Gray's noiseless belt frames for B. O. Carpenter, Perrysville, Ind. Eight pairs Allis rolls in Gray's noiseless belt frames for Messrs. Gail & Huntington, Cumberland, Ind.

The new mill of the E. V. White Milling Co., at Leavenworth, has recently started up and is doing very fine work. Everything worked from the start without a single hitch, speaking well for Messrs. Allis & Co., who planned and built the mill.

From the Great Western Mfg. Co., Leavenworth, Kansas:

Two pair Allis rolls in Gray's noiseless belt frames for J. S. Shipman, Elmdale, Kas. Two pairs Allis rolls in Gray's noiseless belt frames, for Messrs. Strohwig, Rogers & Brown, Marion, Kas. Eleven pairs of Allis rolls in Gray's noiseless belt frames for a job they have under construction. Also eighteen pairs for mills they are remodeling to the roller system.

From the Richmond City Mill Works, Richmond: Twelve pairs Allis rolls in Gray's noiseless belt frames for Messrs. A. R. Logan & Co., Shelbyville, Ky. Six pairs Allis rolls in Gray's noiseless belt frames for J. A. Burns, New Providence, Ind. Ten pairs Allis rolls in Gray's noiseless belt frames for J. B. Little, Franklin, Tenn. A Gray's noiseless belt roller mill for one of their customers.

From Messrs. Willford & Northway, Minneapolis, Minn.: A Gray's noiseless belt roller mill for the Du Quoin Mill Co., Du Quoin, Ill. Six pairs Allis rolls in Gray's noiseless belt frames for Nelson Story, Bozeman, M. T. A Gray's noiseless belt roller mill for E. D. Munger, Kilbourn City, Wis. A Gray's noiseless belt roller mill for Messrs. Klaus, Fox & Co., Jamestown, D. T. A Gray's noiseless belt roller mill for W. H. Maes, Brookings, D. T. A Gray's noiseless belt roller mill for Messrs. Ackerman Bros., Young America, Minn. Eight pairs Allis rolls in Gray's noiseless belt frames for Messrs. Wheeler & Rogers, Wyocena, Wis.

From Messrs. Wolf & Hamaker, Allentown, Pa.: Ten pairs Allis rolls in Gray's noiseless belt frames for T. T. Poole, Lambertsville, N. J. Twelve pairs Allis rolls in Gray's noiseless belt frames for the estate of Sam. Laubach, Copley Station, Pa. Twelve pairs Allis rolls in Gray's noiseless belt frames for Messrs. A. Pardee & Co., Hazleton, Pa. Eight pairs Allis rolls in Gray's noiseless belt frames for Jno. Prizer, Lamberton, Pa. Ten pairs Allis rolls in Gray's noiseless belt frames for Messrs. D. Scheappe & Co., Tamaqua, Pa. Ten pairs Allis rolls in Gray's noiseless belt frames for David Zehn, Tamaqua, Pa. A Gray's noiseless belt roller mill for C. H. Kable, Trenton, W. Va.

Rogers Bros., Bristol, Pa., a Gray's noiseless belt roller mill.

A. D. Bose, Bismarck, Mo., a Gray's noiseless belt roller mill.

H. Holstein, Roselle, Ill., a No. 2 four-break reduction machine.

McEachrow & Co., Wausau, Wis., a Gray's noiseless belt roller mill.

Laughry Bros., Monticello, Ind., a Gray's noiseless belt roller mill.

W. C. Woodyear, Baltimore, Md., a Gray's noiseless belt roller mill.

Keynes & Wellman, Logan, Ohio, a Gray's noiseless belt roller mill.

W. Johnson & Co., Marshall, Mo., a Gray's noiseless belt roller mill.

Schwarting & Co., Walcott, Iowa, a Gray's noiseless belt roller mill.

Appleton Mill Co., Appleton, Minn., a Gray's noiseless belt roller mill.

A. Henshaw & Co., Marcus, Iowa, a Gray's noiseless belt roller mill.

H. E. Brooks & Co., Isinours, Minn., a Gray's noiseless belt roller mill.

Pierce Mill Co., Pierce, Neb., another Gray's noiseless belt roller mill.

Homer Baldwin, Youngstown, Pa., a Gray's noiseless belt roller mill.

J. Essmueller & Co., St. Louis, Mo., a Gray's noiseless belt roller mill.

B. F. Crossett & Co., Janesville, Wis., a Gray's noiseless belt roller mill.

Dan. Shaw Lumber Co., Eau Claire, Wis., a Gray's noiseless belt roller mill.

Ruffin, McDaniel & Co., Carthage, Mo., two porcelain roller mills with belt drive.

T. Trenchard, Fairton, N. J., four pairs Allis rolls in Gray's noiseless belt frames.

Kell Long, New Haven, Pa., six pairs Allis rolls in Gray's noiseless belt frames.

D. F. Gump, Chicago, Ill., four pairs Allis rolls in Gray's noiseless belt frames.

Messrs. J. K. Mueller & Co., Denver, Col., another Gray's noiseless belt roller mill.

W. A. Huffmann Imp. Co., Ft. Worth, Texas, a Gray's noiseless belt roller mill.

Messrs. Allis & Co. have also received the following orders from the trade generally:

L. V. Rathbun, Rochester, N. Y., one porcelain roller mill with Gray's belt drive.

Wilton Mill & Elevator Co., Wilton, Iowa, a porcelain roller mill in Gray's frame.

Slater Mill Co., Blanchester, Ohio, seven pairs Allis rolls in Gray's noiseless belt frames.

Mr. Jno. Craggs, Walworth, N. Y., eight pairs Allis rolls in Gray's noiseless belt frames, etc.

T. O. Kilbourn, Washington, Minn., a porcelain roller mill with Gray's noiseless belt drive.

Clement, Hulme & Kelly, West Bend, Kas., four pairs Allis rolls in Gray's noiseless belt frames.

Miller Bros. & Mitchell, Montreal, Can., a Gray's noiseless belt roller mill for one of their customers.

Messrs. Geo. V. Hecker & Co., New York City, thirteen pair porcelain rolls in Gray's noiseless belt frames.

Jones & Co., New York City, forty-six pairs Allis rolls, part in Gray's noiseless belt frames, four purifiers, etc.

L. Glass, Ft. Atkinson, Iowa, a No. 2 four-break reduction machine, four pairs of Allis rolls in Gray's noiseless belt frames, etc.

Duncan, House & Dawson, Mt. Gilead, Ohio, a No. 2 four-break reduction machine, four pairs Allis rolls in Gray's noiseless belt frames, etc.

M. S. Fisher, Bonham, Texas, fourteen pairs Allis rolls in Gray's noiseless belt frames, and special machinery to put the mill on the full roller system.

Messrs. B. Maxwell & Son, Sidney, Ohio, have contracted with Messrs. Allis & Co. for six pairs of the celebrated Allis rolls in Gray's noiseless belt frames.

Hawkeye Milling Co., Irwin, Pa., ten pairs Allis rolls in Gray's noiseless belt frames, and full outfit of machinery necessary to remodel the mill to the roller system.

The Albion Milling Co., Albion, Mich., are putting up a complete model roller mill, and will use fourteen pairs of the celebrated Allis rolls in Gray's noiseless belt frames.

For various mills in San Francisco and on the Pacific coast, through the branch house, Mr. J. R. Cross, Manager, sixty-four pairs Allis rolls in Gray's noiseless belt frames.

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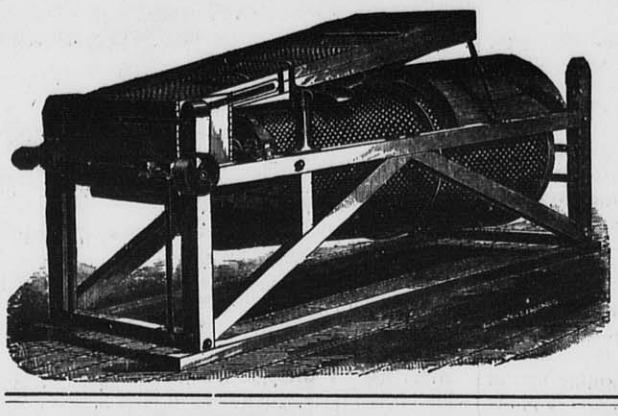

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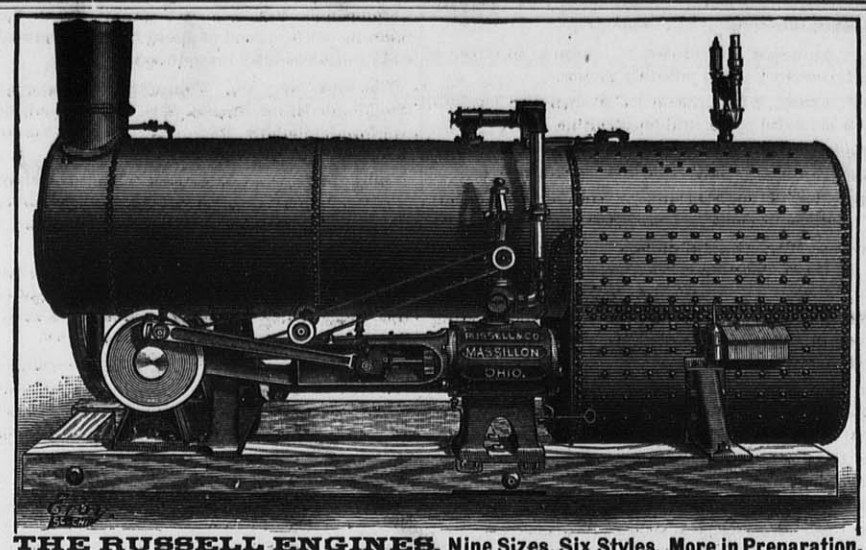

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